

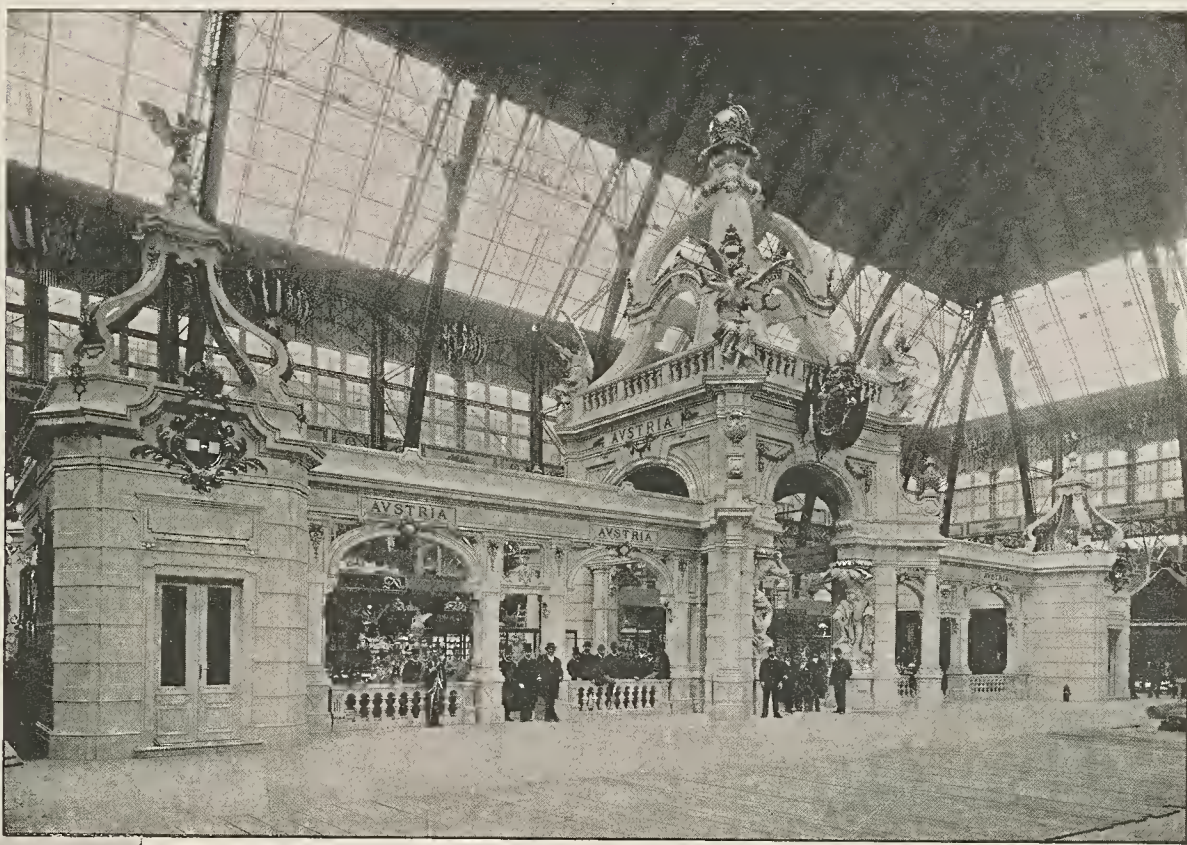


SECTION II.

RETURN TO LIBRARY
ENGRAVING DIVISION

among these groups are illustrated the results of patent processes for the enamelling of iron goods with such perfect finish as to resemble porcelains and china-ware. Among them are flower-stands, ink-stands, vases, shields, console and card-tables, and numerous articles for table use.

In textiles Germany is well represented, with individual exhibits so combined that a single group may contain the choicest products of a score of factories. In one of the windows, for instance, a number of firms unite in



EXTERIOR VIEW AUSTRIAN SECTION

displaying all the processes of silk manufacture, from the cocoon to the completed fabric. Side by side with dress goods and trimmings are silks prepared for upholstery use, for neckwear, umbrellas, and parasols, all these from the mills of a single town. Another town makes a specialty of laces and embroideries, and a third has an assortment of knit goods in woolen, silk, and cotton. Still another excels in lace curtains, which are displayed on the surrounding walls in most elaborate designs. From a state institution at Schneeberg comes an assortment of hand-made laces; from Reichenau a choice display of woolens, and from Glauchau of the women's dress goods produced by the mills of Saxony.

Adjacent to the German section is the Austrian pavilion, and passing between its massive pillars and beneath an arch surmounted

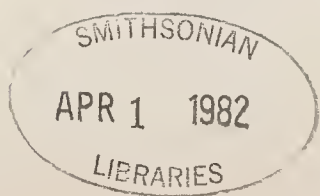


IRON EXHIBIT

by the national Eagles, attention is first attracted by the life-size portrait of Emperor Francis Joseph, woven in cotton and silk by the power loom. This is said to be the first work of the kind executed by machinery, and comes from a Vienna factory. A photograph was first enlarged on a scale of more than fifty to one, the image being reflected on a linen sheet. The outlines made from this served as the foundation for the likeness, which was reproduced on one hundred sheets, composed of nearly 20,000 cards, and the cotton and silken threads of the design drawn through millions of holes



VIENNA EXHIBIT, AUSTRIAN SECTION





AUSTRIAN SECTION



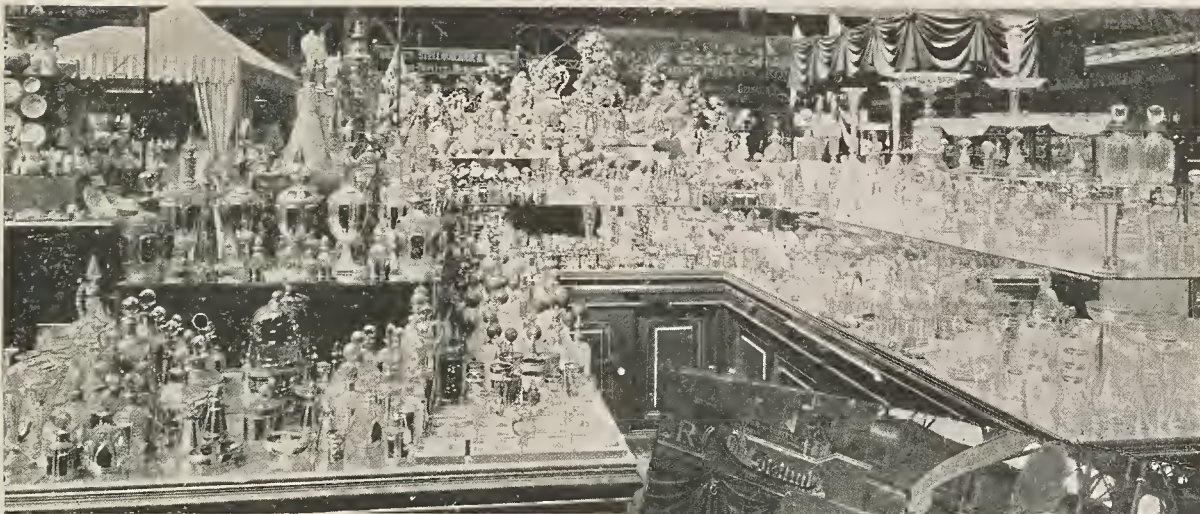
SPANISH FLOWER MERCHANT



BULGARIAN GIRL



SPANISH FLOWER MERCHANT



BOHEMIAN GLASS

As in the German section and the German village on the plaisance, so in the Austrian pavilion, one of the most attractive exhibits is that of art metal work, especially of vases, plaques, ancient armor, and imitations of ancient handiwork. A fine display of bronzes is made by Camerden and Forster, agents in New York for the manufacturers. From time immemorial the Germanic races have excelled in this line of manufacture, giving to their wares a beauty and finish which is not found among those of southern artificers.

But the gem of the Austrian section is the exhibit of Bohemian porcelains and glassware. It was at first intended to establish temporary works in the Midway plaisance, where would be shown all the processes of manufacture; but for some reason this project was abandoned, and we see only the results. No mere factory, however, could explain how for many ages this industry has descended from father to son, each generation patiently striving to improve on the workmanship of its predecessor. The display is therefore the illustrative and collective result of centuries of individual endeavor. All the famous factories of Bohemia have contributed to the exhibit of glassware, which is placed, as it should be, in the

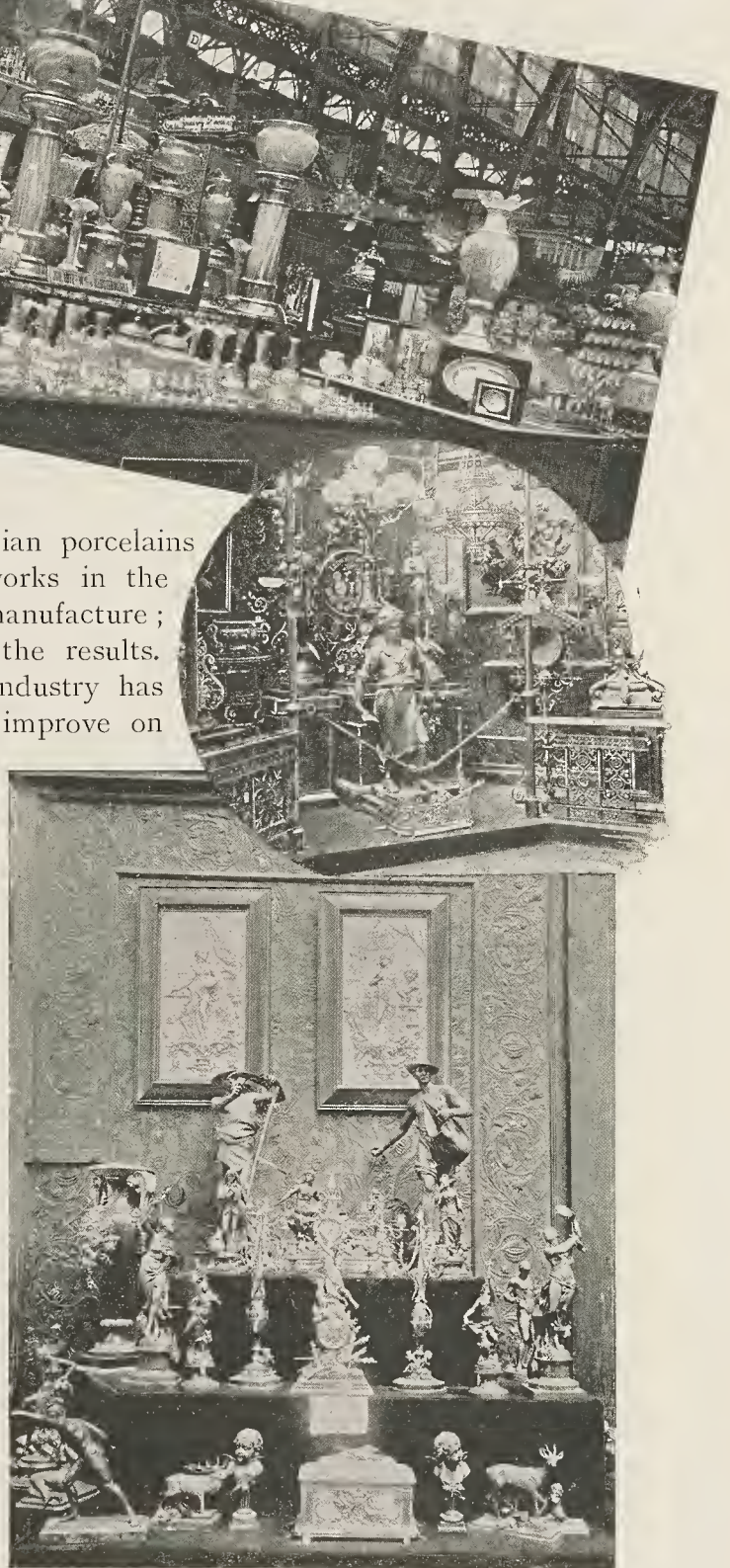
punctured on the surface. An entire year was required for this task, and no wonder that the delicate lines and shadings of the finished portrait aroused the admiration of the emperor to whom it was presented. With his permission it was placed on exhibition in the Austrian section as one of the triumphs of textile manufacture.



AUSTRIAN BRONZE

foreground. As a centrepiece is the tall vase, fashioned in imitation of onyx, and loaned for the occasion by Emperor Joseph.

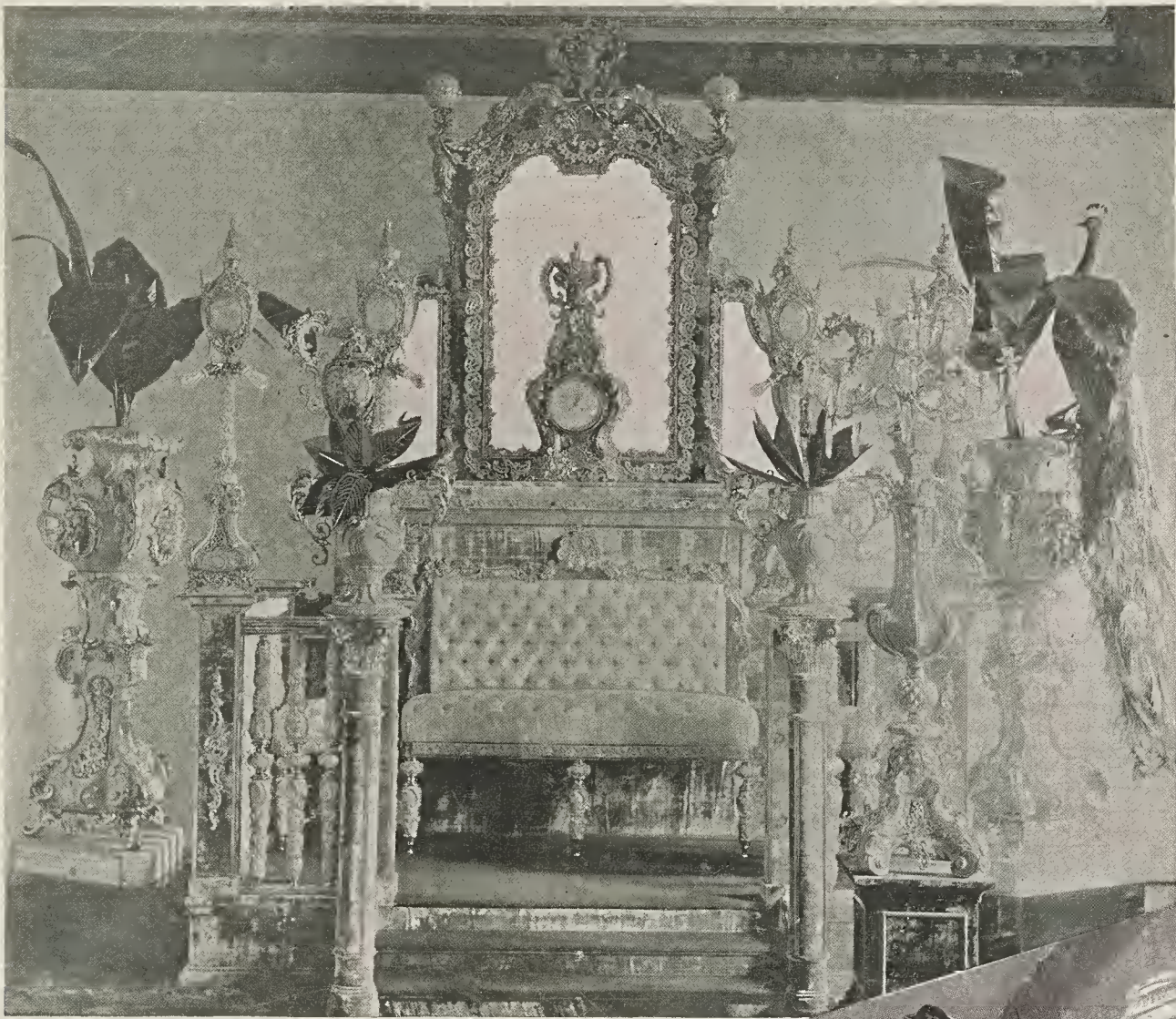
Side by side are huge punch-bowls and tiny glasses, ornamented with arabesque designs, and softly tinted with the hues of wax or pearl. There are entire services of porcelain ware, adorned with flowers and wreaths in gold and light blue; there are beautiful statues of clay so manufactured as to resemble ivory, and as a contrast



AUSTRIAN BRONZE



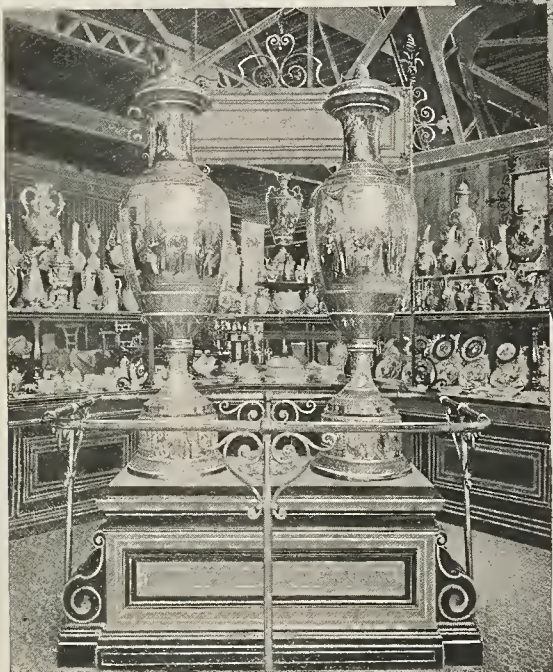
LION FOUNTAIN AND OBELISK, GRAND BASIN



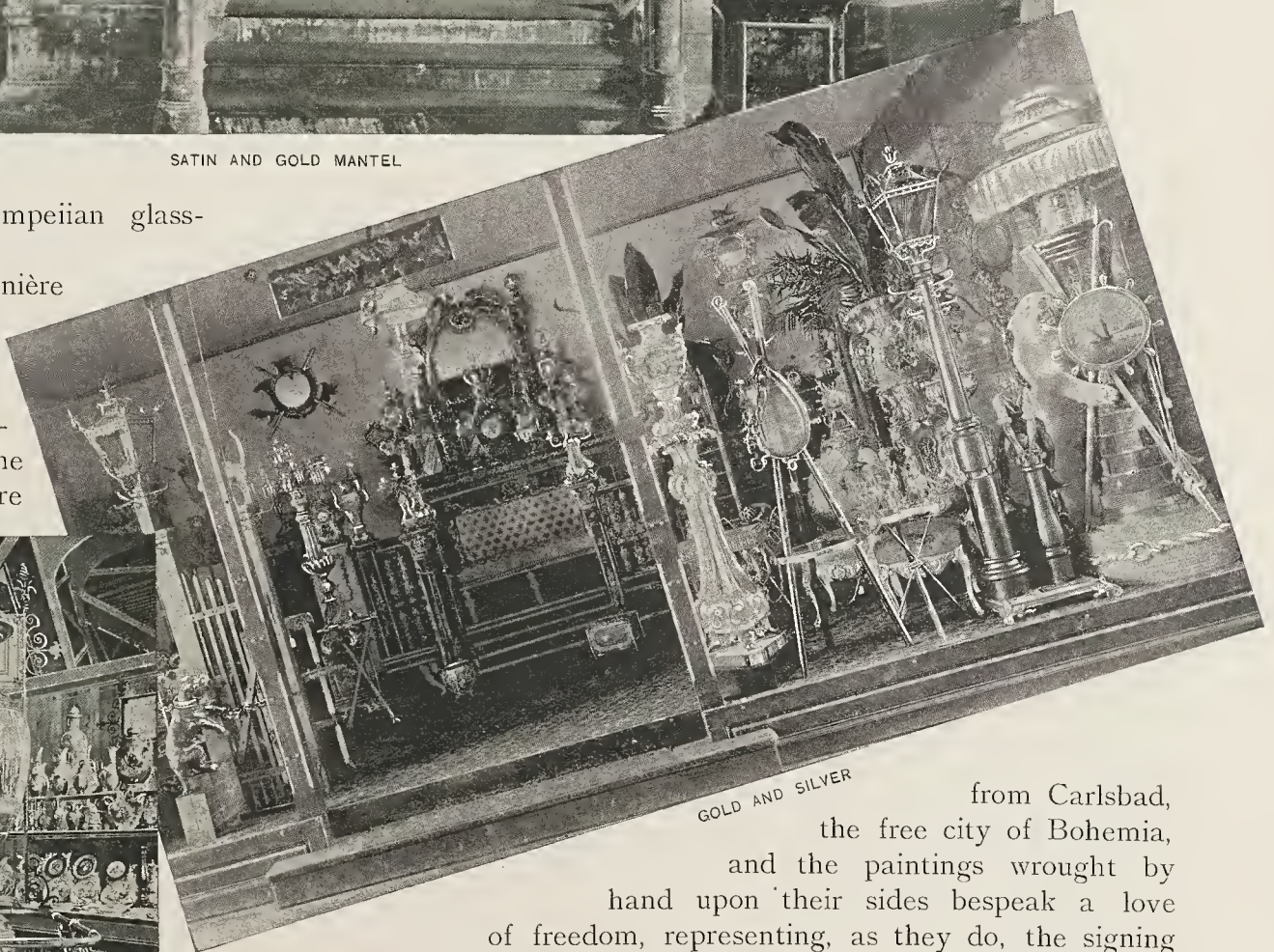
SATIN AND GOLD MANTEL

rose-colored pieces of Pompeian glass-ware.

Around a huge jardinière is a group of decorated porcelain, in royal blue and gold, and near by are two revolving urns, towering above the head of the tallest visitor. The last are

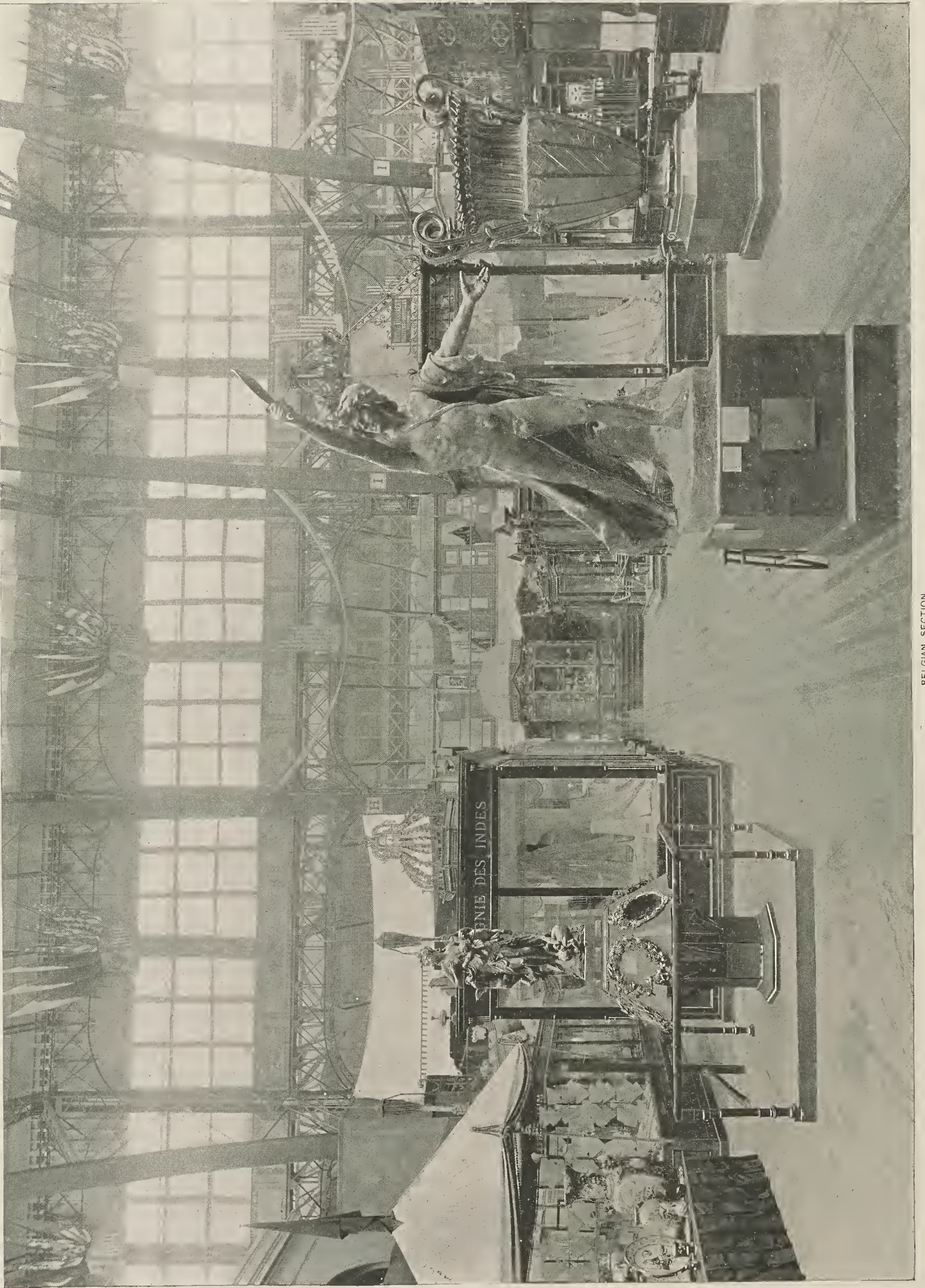


ALTROHLAN VASES



GOLD AND SILVER

from Carlsbad, the free city of Bohemia, and the paintings wrought by hand upon their sides bespeak a love of freedom, representing, as they do, the signing of the magna charta and the declaration of independence, the taking of the Bastille, and the abolition of slavery. Vienna contributes the most varied assortment of fancy articles, together with a large collection of jewelry and gold and silver ware, while the entire monarchy may be said to have an interest in the model room, under the gallery, royally furnished and decorated. By mural paintings, and shrubby plants, the background is made to represent a conservatory opening from a beautifully frescoed chamber. The gilded,



BELGIAN SECTION

heavy furniture is upholstered in rich Gobelin tapestry, and includes a grand piano in ivory and gold, and a huge Moorish clock with fret-work of cunning design.

In the line of leather goods are tables, chairs, and other furniture made of pressed leather, wall decorations and specimens of book-binding, ancient and modern. A treasure guarded with jealous care is a bible bound in silver, its covers inlaid with gold and on the front a vine traced in

To the was accorded a the French panition of the close commercial rela-countries. Here est approach to a display contained Manufactures, for prise was organ-of commerce as Brussels, Ant-

Liège, and other centres of commercial and industrial activity. From each of these bodies members were selected by the king, forming together the Superior Council of Industry, whose special duty it was to see to the choice and preparation of the various collections. The result is a well considered, well proportioned, and skilfully arranged exhibit.

The pavilion, which is of itself a product of native skill and taste, was fashioned by Belgian workmen before being shipped in sections to Chicago. It is of the same height as the French structure, and its lofty central portal, draped with rich garnet portières, forms a sightly entrance way. Within is a bronze statue of Leonidas, at Thermopylæ, by Gaef, one of the foremost sculptors of Bruges, more than seven feet high and cast in a single piece, on its left a bronze urn, and on its right a dainty statuette, representing Innocence Tormented by Love.

First among the exhibits are the finest of Belgian laces, including Valenciennes, Venetian point, Venetian guipure, duchesse, and Mechlin. Near them are the daintiest of shawls and bridal veils, one of the latter made of round point lace, fifteen feet long and a dozen in width, being valued at \$7,000, while for a lace shawl with very few feet of its precious surface twice that sum is demanded. Other textiles of more substantial character, as linens, cottons, and dress goods, though forming an excellent display, attract but little attention as compared with their costly environment.

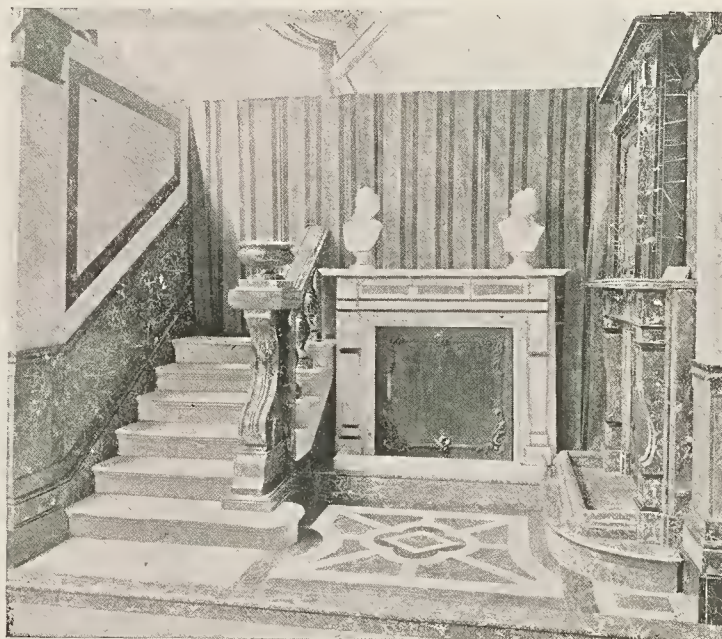
Ceramic wares, in the form of vases, porcelain sets, and glassware, cut, etched, engraved, and stained, fill other portions of the pavilion. Deserving of special mention is the fine display of porcelains, table-ware, tiles, and mural decorations by a La Louvière firm. The exhibits of marbles is also worthy of note, including, among other pieces, a handsome staircase and fireplace, into which are worked eight different native varieties.

Liège has long been recognized as one of the great centres for the manufacture of small arms, both for military and sportsmen's use, its collection forming a prominent feature in the Belgian section. One of the largest establishments has a collection not only of guns, but of unfinished weldings, with a view to illustrate the methods of manufacturing



BELGIAN SECTION

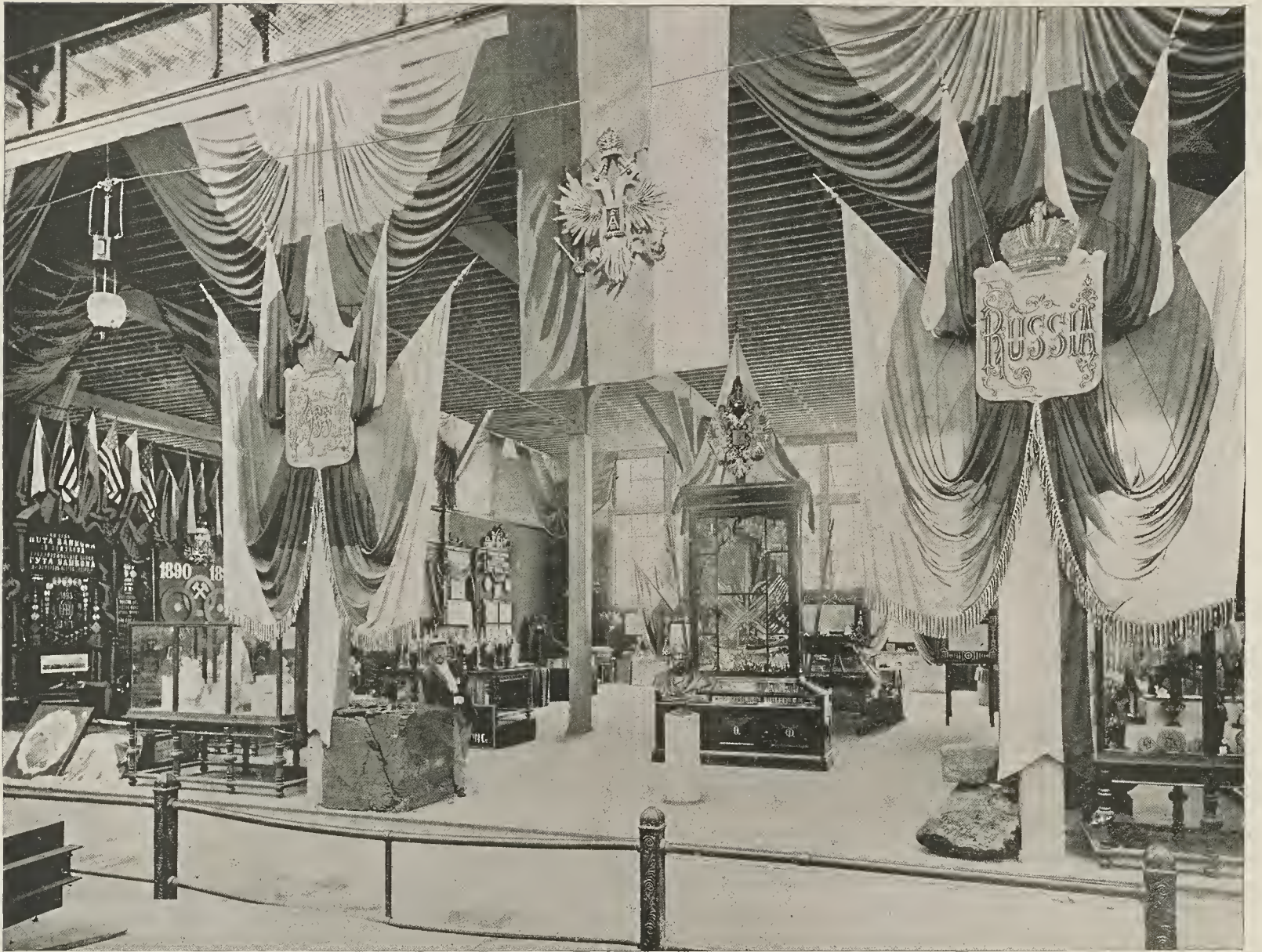
Belgian section site adjacent to vilion, in recog-geographic and tions of the two wc have the near-purely national in the hall of the entire enter-ized by chambers among such cities wcrp, Ghent,



MARBLE EXHIBIT, BELGIUM



VASE, BELGIUM



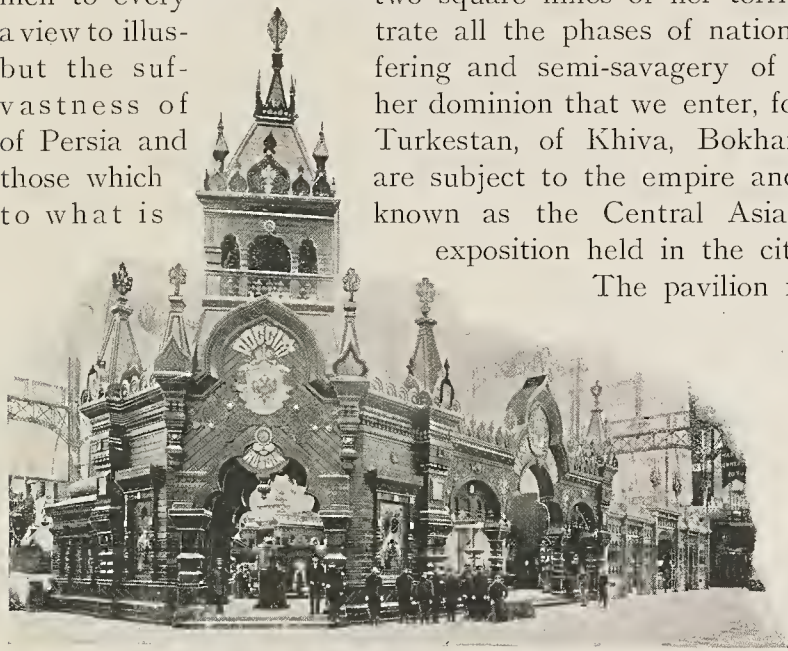
RUSSIAN SECTION



NORWAY SECTION

Damascus and twist barrels. But to enumerate all the branches of manufacture represented in the 45,000 square feet allotted to the Belgian department would be an endless task. Prominent among them are the draperies, decorative panels, and paintings, and other applications of art to household use. A suggestive feature also is the exhibit of soft felt hats and sombreros, of which many millions are imported by the United States and Latin America.

The vast empire of all the Russias, occupying nearly one-fifth of the land surface of the earth, is represented in the hall of Manufactures by some 40,000 square feet of exhibiting space, or about one square inch to every two square miles of her territory. The exhibits are arranged as they should be, with a view to illustrate all the phases of national life, representing not only the luxury and civilization, but the suffering and semi-savagery of the empire. Thus it is with a realizing sense of the vastness of her dominion that we enter, for instance, the Asiatic room, and here compare the fabrics of Persia and those which are subject to the empire and those which she is striving to render subject, contribute to what is known as the Central Asiatic exhibition, which was also displayed at a former exposition held in the city of Moscow.



EXTERIOR RUSSIAN PAVILION

The pavilion is of the ecclesiastic style of Russian seventeenth century architecture, with the principal entrance at the corner, in the form of a lofty arch surmounted by a tower, and with a smaller door-way in the centre of its façade, fronting on Columbia avenue. Near the main portal are two vases of red jasper, forwarded by the royal museum, and which it would be extremely difficult to duplicate, while the copies, in lapis-lazuli and malachite, of others in the royal palace at St. Petersburg cannot be readily detected from the originals. Other vases and urns of most intricate workmanship are contained in this collection, with statuary and mantel-

pieces, fashioned of porphyry, obsidian, jasper, malachite, and various ornamental stones, aglow with nature's richest hues.

In the bronze collections, more than in any other are illustrated the extremes of Russian life, one group being devoted to the army and the government, which are virtually the same, and another to the lowly and suffering peasantry. In this exhibit are many pieces by the sculptor Lanceret, whose recent death was a loss to the empire and to art. In addition to these works are allegorical figures and statuettes in solid silver, one of them, mounted on red jasper, representing Alexander bestowing freedom on the serfs, and rescuing Bulgaria from the grasp of Turkey.

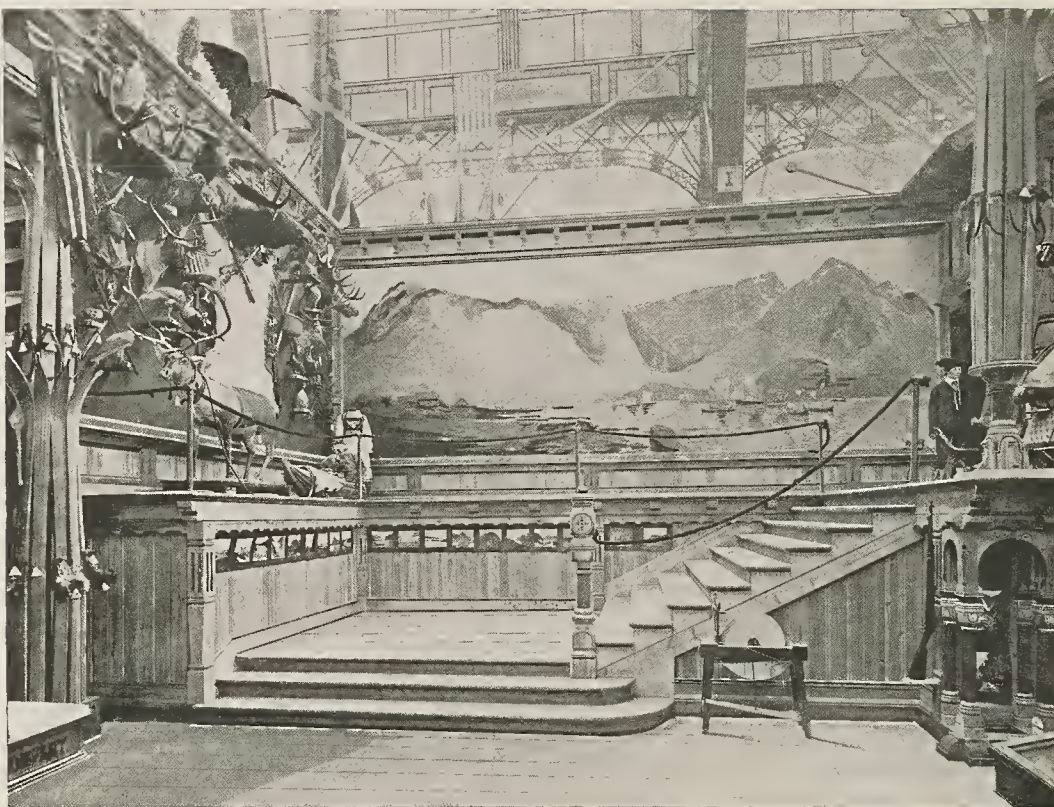
Silver-ware is displayed in many rich and attractive forms, much of it belonging to the imperial household. The enamelled variety indicates the revival of an ancient process of manufacture, which is gradually being extended to other countries. Some of the pieces seem almost transparent, so delicate is the material used, the designs being added by pouring melted enamel into the ornamental figures. The skill required to perform this operation and the danger of destroying an entire piece by a single mistake gives to these wares their high marketable value.

Russian furs, which form a most important article of commerce, are displayed in every conceivable class and form. There are stuffed animals, skins, and robes, with costly garments, composed wholly or in part of furs, such as are worn by the highest officials, and by the titled dames of St. Petersburg and Moscow. Garments also may be seen such as the Siberian huntsmen wear when in chase of the bear, the sable, the otter or the seal. Among other exhibits are many which tend to reveal the more luxurious phases of Russian life. Furniture is shown, made of native woods, artistically carved and ornamented, with the choicest of Russian silks and rich sacerdotal vestments, worked with gold and silver thread upon silken textures. In the more homely groups of cotton and woolen goods, the display is also creditable, St Petersburg, Moscow, and Piotrkov being well represented in these branches. In a word, except for leather goods, the crude metals, and a few other items, the Russian exhibit is almost a reproduction on a smaller scale of the great fair which for centuries has been held at Nijni Novgorod.



RUSSIAN BRONZE

Norway's exhibits are for the most part divided between the Manufactures and Fisheries buildings, but with several in each of these departments which are officially classified with others. The Agricultural division, for instance, including food and its accessories, related machinery, and forest products, is represented in the hall of Manufactures by the displays of milk-condensing companies, of makers of liqueurs, wines, and malt liqueurs, and of the products of wood pulp mills. Various farming implements are shown, and an ingenious milking apparatus operated by a suction pump. The exhibit of timber for house-building purposes is mainly confined to the pavilion itself, which is constructed of Norway pine, and whose facade contains some excellent specimens of native carving in



CORNER NORWAY SECTION



NORWAY SECTION

wood. With the exception of a few designs in simple colors at the main entrance, the pavilion is untouched by paint or oil, and though somewhat overshadowed by the loftier structure of Russia, shows to excellent advantage the natural beauties of Norway pine.

An attractive feature is the collection of Norwegian birds and beasts, including stuffed water-fowl, polar bears and deer, mounted on stands, in cases, or suspended from the walls. Norwegian granites and marbles are displayed in the form of polished columns, fireplaces, slabs for wainscoting, paper weights, and smaller articles. In the centre of the court is a tall monument, each panel representing a different variety of marble, the quarrying of which is a comparatively new industry in Norway. At the back of the pavilion is an exhibit of a national character, prepared by the Norwegian Home Industrial society, and by several private firms which make and export the costumes characteristic of the country. Here may be seen, attired in their usual garb, the Norwegian wife and maid, the peasant and hunter, with birds and animals on every side, and with large photographs scattered throughout the apartment, adding to the realism of the display.

To the tourist and sportsman an interesting feature is the quaint collection of snow-shoes, skates, sleds, and carriages; nor should we omit the models of locomotives, railway-cars, and steamers. One



NORWEGIAN CARVED WORK

of the railway-cars is so constructed that its wheels are adjustable to tracks of various widths. There are also models of the tourist steamers *Venus* and *Mercury*, which travellers in picturesque Norway will doubtless recognize. The snow-shoes are of all patterns, from simple strips of wood with a strap in the centre, to such as are delicately inlaid with mother of pearl, while the skates vary in style from wooden articles with heavy steel runners which turn up at the toe to those of modern make, fashioned of aluminum, and with the lightest of blades.

The industrial products of the peasantry are illustrated by choice specimens of embroidery and needlework, and by ingenious wood-carvings in the form of boxes, card-receivers, photograph-cases, paper-knives, spoons, and tankards for wine and beer. Elsewhere in the exhibits of wood and metal work the convivial habits of the Vikings and their descendants are brought into prominent notice. Among them are ancient wine-horns, ornamented with silver, which, on festive occasions, the guests were expected to empty a prodigious number of times. Native smiths have also reproduced in silver the massive cups of earlier days, while among originals is a tankard of 1683, and a wine-cup of 1790. Another relic, more admired than any is a crown of silver, made in the



SWISS MUSIC BOXES



SWISS WOOD CARVING



THE PANTHER HUNTER

pre-Columbian voyages. Its furniture is a reproduction of that which is used in Iceland at the present time. Upon the outer walls of the pavilion are also pictures illustrating those stirring times in the northern seas, one of them representing a Danish fleet crossing the North sea in 860, another some primitive craft touching in 980 at a foreign shore, perhaps that of Rhode Island or Massachusetts.

The main exhibits are divided into four classes, and passing through the chief entrance, we come first to the rich display of gold and silver, introduced by the equestrian statue of King Christian, mounted on the charger which for many years he rode on public occasions in Copenhagen. It is made of silver, the work being modelled from a photograph by Heinrich Hansen. Rosenberg castle, the King's summer residence, built early in the seventeenth century, is shown in a model of gold and silver consisting of 1,700 separate pieces. The principal manufacturers of gold and silver-ware also make creditable displays of ancient work, either as originals or imitations.

Prominent among the ceramic wares are those of the royal porcelain factory of Copenhagen, occupying the centre of the pavilion. Among its exhibits is a service, in rococo style, each of its pieces with landscape decorations by a Danish artist, and representing in all the labor of many years. Of works of art in underglaze there are not a few by prominent members of the royal academy.



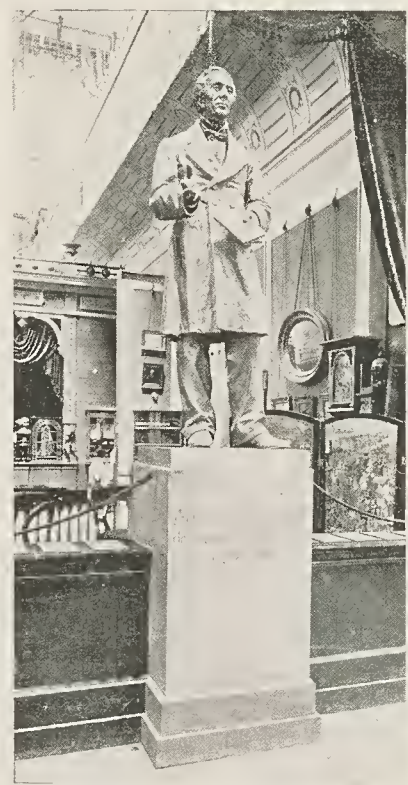
HANS ANDERSEN'S ROOM

Elsewhere in the Danish pavilion are figures and vases in terra cotta, with furniture of oak and walnut, wall-hangings in silk and figured leather. Dainty embroideries, laces, and articles of domestic decoration represent the women of Denmark, and the exhibition of the Danish Sloyd association illustrates the system of manual training in the form of an industrial school, with specimens of printing and book-binding presented by leading publishers.

seventeenth century, and worn by the brides of several generations descended from a prosperous peasant's family. A dozen Norwegian manufacturers send their contributions of antique Scandinavian silver-ware and ornaments, filigree and enamel work, the exhibits of gold and silver-ware, jewelry, and other articles of personal decoration forming one of the strongest features in the Norwegian section.

On the opposite of Columbia avenue are the Danish and Swiss pavilions, of which the former is recognized by its lofty towers and its coats of arms. On either side of the main entrance are bronze statues of Thorwaldsen and Hans Christian Andersen, near which are collections of personal relics commemorative of their national characters. In fact, the room is substantially reproduced in which the charming writer of fairy and other tales lived and labored for so many years. His writing desk, inkstand, pens, fire screen made of newspaper clippings, clock, spectacles, pictures, sofa, and several original manuscripts are placed as he loved to see them when in the flesh, bringing his personality home to us as never before. The entire collection was loaned by the royal museum of Copenhagen, which also permits the visitor to linger over many curios illustrating the career of the great sculptor. He it was who built the museum itself, which is here reproduced in miniature, together with most of his works of art which grace it. Side by side with the model is a case containing the hat which he wore at his triumphal entry into Copenhagen in 1838, together with the medal of the order of knighthood conferred by the king, his favorite pipe, cigar cases, match boxes, autograph letters and sculptor's tools.

The Erikson room, dedicated to the memory of the bold voyager for whom has been claimed the discovery of America, contains rude sketches believed to refer to these



HANS CHRISTIAN ANDERSEN

Entering the dark colored Swiss pavilion, beneath the arch which bears the national cross of red, the visitor finds himself surrounded by colored crayon pictures of the castle of Chillon, Jungfrau, Mont Blanc, Geneva, Lucerne, the Bernese Alps, and other romantic scenery, which serves for a time to draw his attention from the lower planes of industries. Soon, however, he observes that watches and watch-making occupy much of the space, Geneva, of course, making the strongest exhibit. Several of the firms not only display time-pieces, but every portion of their mechanism, an entire family of watch-makers showing how the different parts of the watch are distributed among the cottagers to be finally put together at the factory.

Wood carving is also one of the most prominent industries of Switzerland, where the gables of their houses,



EXTERIOR ITALIAN PAVILION

the framework of their doors and windows, and the interiors of their residences are rich with sculptured ornamentations. The natural taste and skill in this direction, developed by centuries of practice and by the efforts of industrial societies, is now the source of a good revenue, many large firms exporting such articles of virtue to European and foreign lands. Forty of these houses make exhibitions in the Swiss section, and about twice that number of watch-makers, and manufacturers of scientific instruments and music-boxes.

At the main entrance of the Italian pavilion, with its dress of cream and gold, is a bronze statue of a lion and his prey, flanked by the famous group of "The Wrestlers," and near by a figure of Augustus Cæsar, and tile paintings by Achille Mollica. Throughout this section statuary is scattered in lavish profusion, and the life-like beauty of the creations in pure marble is further enhanced by the hangings of heavy velvet which form the chief accessories to the exhibits themselves. Among them is a Psyche from the studio of Rossa, and images of Rebecca, Esther, and Margherita by one of the few real artists who are also dealers in works of art. Columbus, bent and feeble, is taking his last view of land, and in a somewhat daring combination of marble and bronze is the figure of a female slave, the head, arms, and feet of metal, and the drapery of two varieties of marble so artistically blended that they appear to be cut from a single block. Worthy of note also are those which depict the eager fresh delight of a group of children, for the first time absorbed in the marvels of the stage, in contrast with which are the figures of a little girl, first with a live bird in her hand and then with its dead body, the face and attitude symbolic of joy and sorrow.

In the northern portion of the pavilion are the wooden carvings, not a few of them second only to those in marble. On a large panel of Italian walnut, for instance, are groups of cupids, flowers, and birds of most artistic execution. The famous iron doors of San Marco are reproduced in miniature, and as specimens of furniture carvings are massive and handsomely decorated sideboards, cabinets, settees and mantels. Among others worthy of note are the decorative carvings and figure delineations of Francesco Toso, of Venice, whose death occurred in Chicago while earnestly striving to make the entire exhibit worthy of Italian art and workmanship. Toso was partial to dark-hued woods, and his negroes in ebony will not be soon forgotten; neither will his cupids, having as background garlands of flowers. His masterpiece, however, consists of the figures of Marguerite and Mephistopheles, carved from opposite sides of the same block of wood, their life-like forms reflected in a mirror, so that they seem to be walking together. Other carvings from wood are in the shape of guitar players, gondoliers, punchinellos, etc., illustrative of the gay and grotesque. Still another group represents a score of old-time Italian servants, and there are several specimens in wood is so stained as to resemble

Glass-ware, ceramics, mosaics, and cameos are represented in forms for has ever been famous. The majolica ples, the Byzantine mosaics, the Venetian furniture of all designs inlaid with liberally displayed. Of choicest texture manufacture of which, under the patronage revived a long dormant industry. In the shell with over fifty figures carved upon family of England. Coral jewelry, emshell, and bronzes reproducing many Pompeian attractions

Adjacent western corner the sections old-time decorations its gloomy ceilings and impressive salient features of further tend

state. At one of the entrances is a court inclosed with rich specimens of stained glass and mosaics, with a back-ground of gilded moldings.

Barcelona plays an important part with her exhibits of glass and mosaic work, of rugs and blankets, and other manufactured products of that historic city, still one of the industrial centres of Spain, especially in the production of textile fabrics. Here was held in 1892 an exposition of industrial arts, designed principally to illustrate the technical skill of Spanish working-men, and the best of the exhibits there collected were forwarded to the World's Fair, forming the bulk of the display in the Spanish section. There are silks of antique pattern, swords, ceramic wares and tiles, carvings in metal, chemicals, soaps, cordage, and a small collection of Spanish books. One of the most monumental works contributed by the editors and publishers of Spain is the Spanish and South-American directory. There are also some unique bindings in leather, metal, and wood. Of special interest to women are the point d' Alençon, Chantilly and other laces, and the photograph of the infanta Eulalia, taken in Barcelona, many years ago.



ITALY



MARBLE, ITALY



ITALY

which the bronze.

inlaid work, which Italy ware of Na-tian glass, ivory, are

and tracery are the Venetian laces, the age of the queen, has within recent years, case which contains the cameos is a it, among them members of the royal bossed leather work, carvings in tortoise famous pieces of statuary, with replicas of utensils and ornaments, are among the over which the fair pilgrim is apt to linger.

to the Italian division and in the southern of the Manufactures building, are allotted to Spain and certain of her pendencies. The Spanish pavilion, with arches, its massive pillars, its pink richly fretted ornamentations, is an structure, reproducing some of the more tures of the cathedral of Cordova. A religious images, tall candelabra and tapestries in which are recognized the the pope and the queen-regent of Spain, to create an atmosphere of church and

The small area originally granted to Portugal was transferred to Italy; but in the exhibits of her former New World empire of Brazil, as also in those of the Argentine republic, a portion of the ancient Spanish vice-royalty of Buenos Ayres, we have sufficient evidence that primitive systems of



ITALIAN FURNITURE

with one or two exceptions, that of any European power, and that this amount has been well expended is nowhere more apparent than in her department of manufactures. Here in truth is one of the surprises in which the Exposition abounds; for by many, even of the more cultured class of visitors, men well informed as to the agricultural and mineral wealth of the young republic, little was expected in this direction except for a slender display of textile fabrics, the fashioning of basket work and of household utensils from clay and cocoa-nut shells, with preparations of tapioca, manioc, chocolate, dye-stuffs, and india-rubber, with perhaps a few hammocks of fine material and workmanship; for to Brazilian Indians is attributed by some the invention of these articles of modern comfort. But entering this section, the first thing noticed is a choice collection of ceramics, mosaics and wall-papers from Rio Janeiro, and the states of St Paulo and Bahia, with saddles richly embroidered in gold and velvet, with inlaid wood-work, and massive ebony furniture. The Columbian era is illustrated in the ethnological division; the nineteenth-century era in the manufactures division. Government is represented by the guns and models of cannon sent from the naval arsenal at Pernambuco, and by the uniformed dummies of officers, musicians, and privates.



ITALIAN DECORATIONS



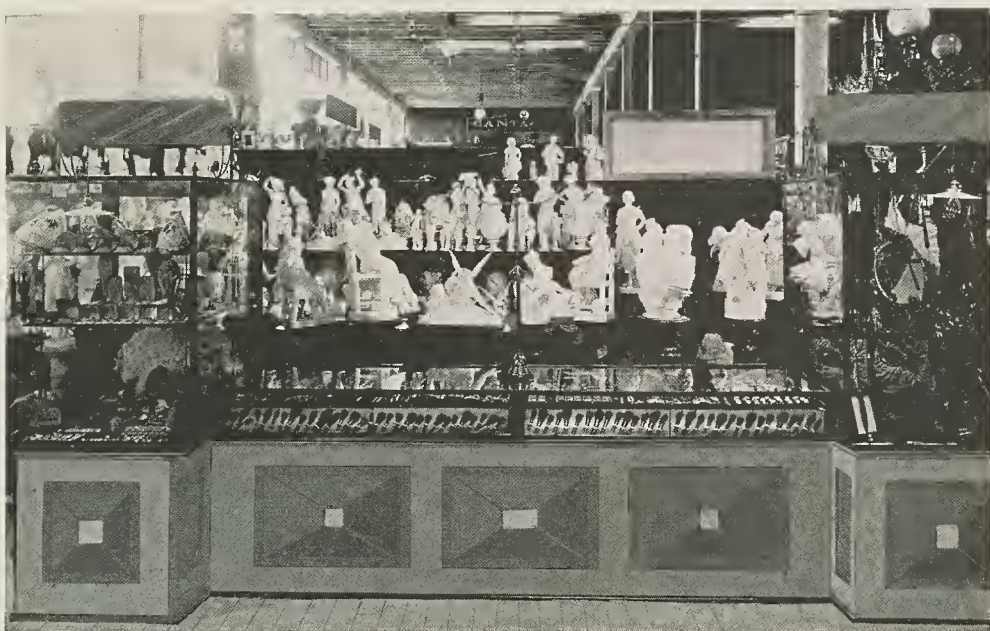
BRONZES, ITALY

manufacture are being rapidly superseded by modern methods and machinery.

In connection with the Brazilian section, it may here be mentioned that her appropriation of \$600,000 exceeded,



ITALIAN CHINA

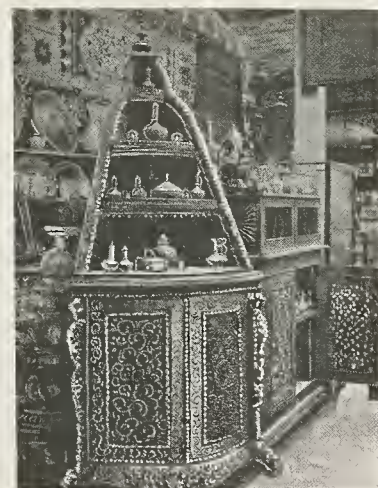


ITALIAN STATUARY

The display of the Argentine republic serves also to counteract the prevailing idea that for the most part it is a country of pampas Indians, who scour the plains in search of cattle and ostriches, ever on the look-out for scattered settlements and wandering settlers. True, in her fine art gallery, installed in this section, is a painting which represent a foray of savages upon a defenseless village; but such scenes are merely incidental, as are those in which the leading rôles are played by gauchos or half-breeds of Spanish and Indian blood, who tend cattle, capture wild horses, protect the frontiers, and wage constant war against the savages of the pampas.

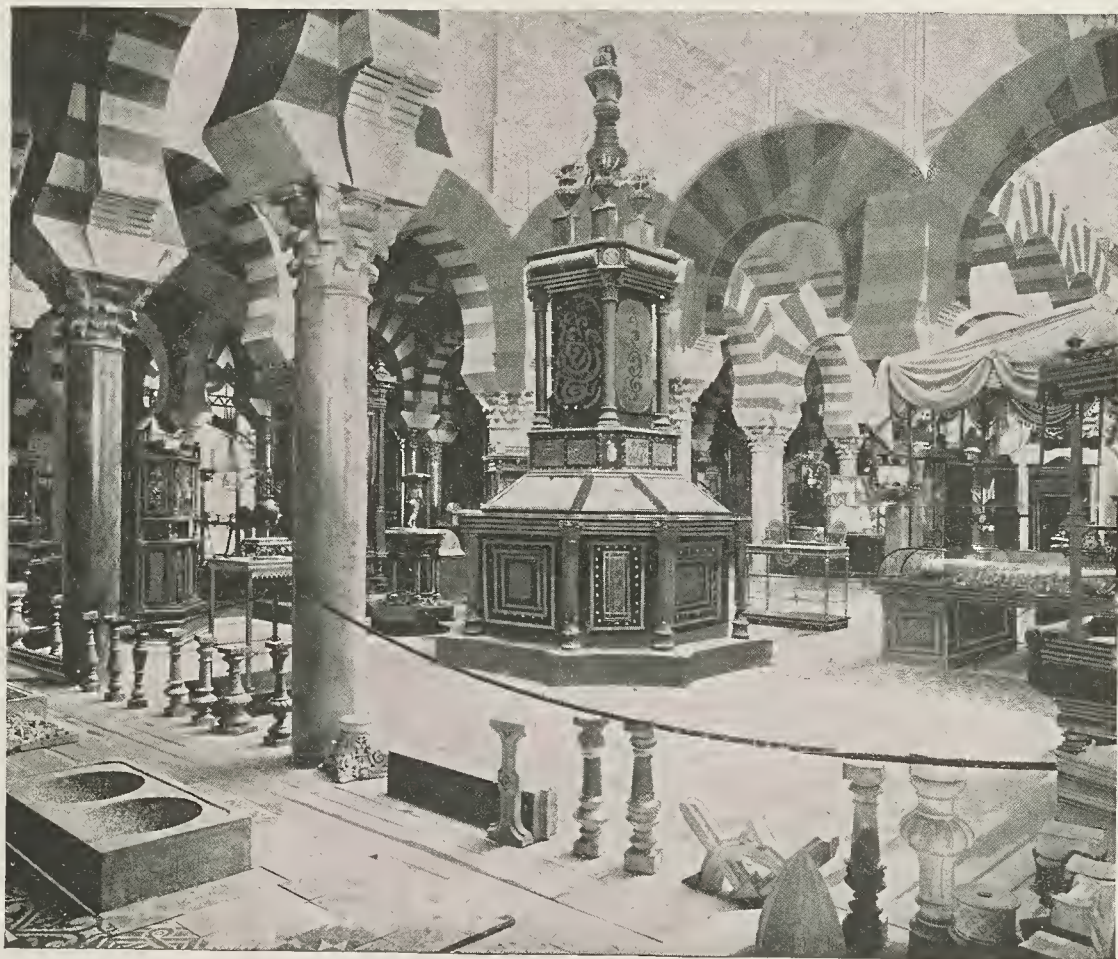
But although long Indian spears and bolas or lassos with iron balls at the ends play a small part in the Argentine exhibits,

they are merely accessories to the real display of modern industrial life. All the world knows that the republic stands well in primary manufactures of leather, hair, wool, and meats; but here are also paintings of no small merit, with mosaics, bronze figures, delicate wines, liqueurs, chemicals, perfumes, billiard tables, and other articles which show that the Argentinians are not merely an agricultural and pastoral nation. A form of industry, which is neatly represented and is quietly developing into considerable importance is the manufacture of oils from pea-nuts, grapes, and flaxseed, the last in the form of what is commonly known as linseed oil. The country is well adapted to the raising of grapes and barley, and the influence of the Italian, French, Spanish, English and German elements is seen in the rapidly increasing production of wine and beer, as is fully illustrated in these exhibits. Concentrating her exhibits in this section, the republic also presents specimens of government printing in the way of bank notes and postage stamps, a large frame near by containing the title pages of various literary and musical works issued by publishing houses within recent years. Here also are cases filled with the fancy work made by orphans under the care of the state, and the religious orders.



INDIA CARVED FURNITURE AND VASES

In Mexico's division is fairly represented her industrial progress within recent years, now that the successive administrations of President Diaz have put an end to revolutions, or predatory raids in guise of revolution, which followed the acquisition of independence. Her section is enclosed by a glass partition, on one side of which are specimens of wood carving from old Spanish churches, most of them representing sixteenth century art. On the opposite side are several pieces of primitive artillery, such as were used in the days of Cortés, side by side with models of some of the last pieces of ordnance cast at the national foundry, and among other historic articles near by is one of the swords of Cortés. In a small picture gallery are portraits representing the military and civic leaders to whom the republic has accorded places of honor.



SPANISH SECTION

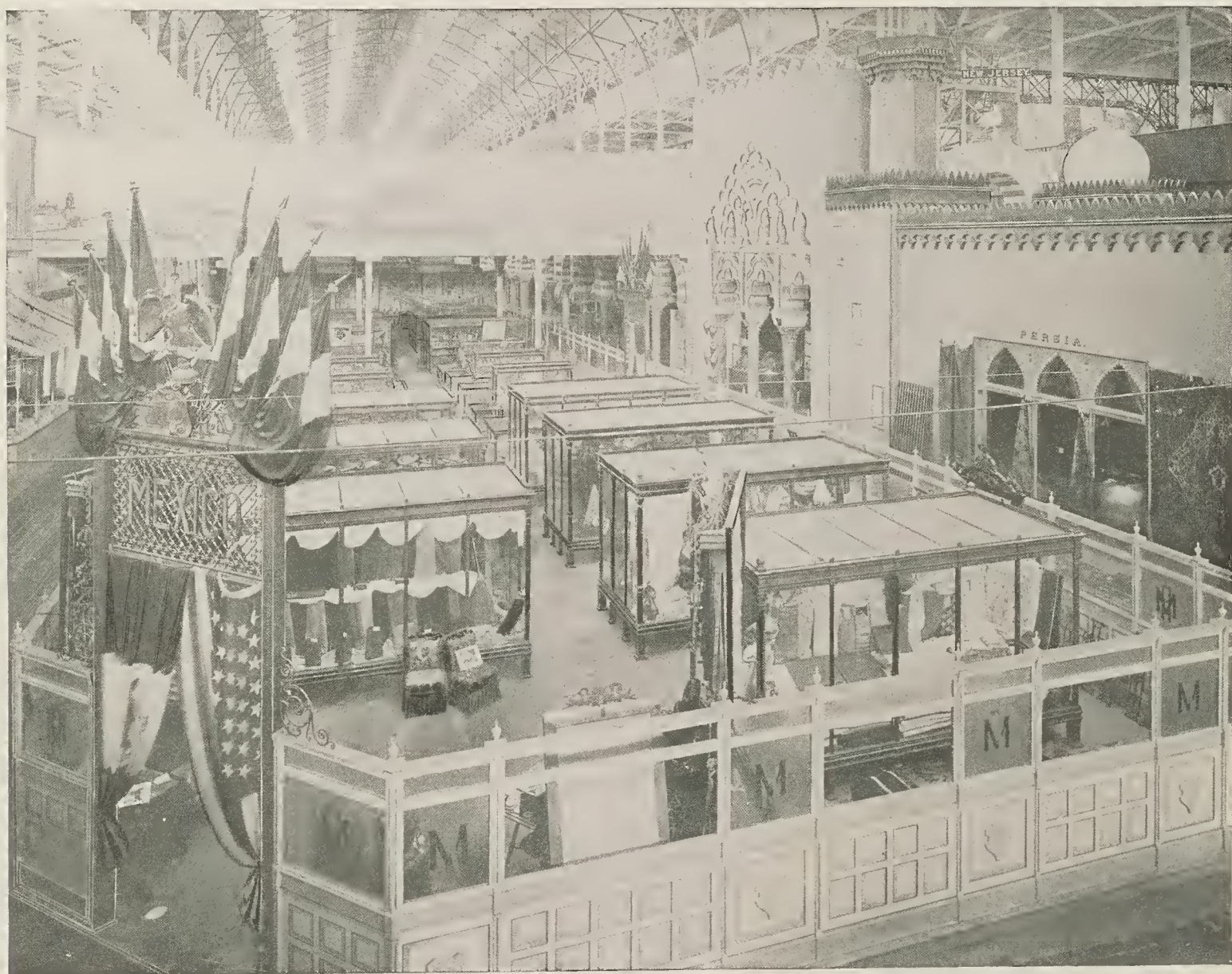


ARGENTINE REPUBLIC EXHIBIT

The display of manufactures consists mainly of pottery, bronze, onyx, artificial flowers, and textile wares, including, among others, cordage and hammocks fashioned of heniquen fibre, the sisal of modern commerce. Specimens of bronze work and cotton goods of native manufacture represent two of the new industries of the southern portion of the republic. The clay pottery and the artificial flowers are largely the handiwork of the Mexican Indian, who is a deft, though untrained modeller, and possesses in an eminent degree the faculty of imitation. So also with the groups of onyx, whether in slabs or fashioned into such articles as scarf and shawl-pins,

watch-charms, paper-weights, and plaques for the decoration of walls, on the last of which are painted figures typical of Mexican life. Of embroideries, laces, and other delicate fabrics there is a collection which will not suffer by comparison with those of European make.

Somewhat in contrast are the exhibits of Turkey and Bulgaria, the former consisting of a single display of oriental rugs, while the latter has furnished well selected specimens, not only of her manufactures, but of her



MEXICAN EXHIBIT



PRESIDENT DIAZ

king intrusted the twenty-five of them taken from the royal toms and industries of this whose monarch, ministers, and fidence in the United States foreign powers. The collection ments especially made for the screens, mats and hangings interior decoration of the palace. by the nobles, is not unlike plaisance, but provided with eter, over which is the seat. ever, the chair is borne on the each end. There are also spec- tured by the Coreans, varying stance used to carpet floors is as fine and glossy as silk. jealous as to the secret pro- these fabrics. They claim, Japanese what they know of rather that their southern away their artisans and their teresting of the curios are spec- known as Satsuma ware, the a lost art. The pieces still priceless treasures, kept as heir- another. A bowl, belonging to years old, is of a greenish color, delicate texture, and richly polished and decorated on the outside. Corea also presents an exhibit of her medicines, and is especially proud of the ginseng root, said to be worth almost its weight in gold, and especially esteemed by the Chinese as a curative for disorders arising from the use of polluted water. The curing of tiger skins in which the natives are experts, also forms a considerable source of industrial revenue. Of minerals and metals there is a large collection, and among miscellaneous arti- cles are carpenters' tools, cabinets, lacquer-work, tobacco-boxes, ves- sels of brass and pottery, grains, nuts, seeds, kite-reels, chess-boards, candle-sticks, hairpins, and entire suits of clothing for men and women, showing the national dress of the common people, and of those of high degree. An interesting feature is a group of brass cannon made in the tenth century, about the size of a small howitzer, but with barrels wrought in modern style.

Between the Argentinian and Mexican exhibits is the richly carved, gilded, and colored pavilion in which were housed, at the Paris Exposition of 1889 the exhibits of Siam, and reproducing the garden house of the Siamese king. Although only twenty-six feet square, it is one of the most unique and attractive structures in the

agriculture and her national costumes, those of the peasantry in their gay attire, and those of her soldiery and civic officials. Of wheat in the sheaf and in the kernel, of barley, sesame, and other food-plants there are many fine samples in her neat pavilion. Here also are attar of roses, wines, tobacco, silk, and hand-made textiles, including an embroidered carpet with 500 square feet in area, and in a single piece, while finely wrought harness and wood carvings, with the tall candles made for cathedrals and religious ceremonies, and a hundred other articles illustrate some form of industry or national life.

South of the Ceylonese section is the toy-like pavilion of Corea, for even the so-called hermit kingdom, though yet secluding herself from the influences of western civilization, has sent commissioners and an exhibit to the World's Fair. Of these com- missioners in their flowing silken robes and tall Corean hats, one is the minister to the United States, resident in Washington, and another the secretary of the American legation at Scoul or Seyool, the capital of the kingdom. It was to the latter that the

or more tons of exhibits, most palace, which illustrate the cus- strange and isolated nation, people have probably more con- than they have in any of the includes a variety of silken gar- queen's ladies, and embroidered give the visitor an idea of the A sedan chair, such as is used some of those in the Midway a wheel about four feet in diam- Except on level ground, how- shoulders of servants, six at imens of the paper manufac- in grade from the tough sub- and roof houses to that which The Coreans are extremely cesses by which they produce moreover, to have taught the the manufacture of pottery, or neighbors have forcibly carried secrets. Among the most in- imens of the ancient pottery, manufacture of which is now possessed by the nation are looms from one generation to the king, and more than 500



TABLE, MEXICO



INDIA CARVED SIDEBOARD



OTTOMAN EMPIRE EXHIBIT

the Siamese as with the Chinese, there are many families who live entirely in boats. Within and without the pavilion, are depicted in photographs the royal family with scenes characteristic of Bangkok.

A remarkable piece of workmanship is a series of figures representing Buddha in different attitudes, all carved from solid tusks of ivory, and framed in an intricate floral design. That the stories told of the rich deposits of gems on the banks of the rivers and streams of Siam are not unfounded may be inferred from the collection of rings, bracelets, toilet-sets, and trays, the framework of which is gold, and the decorations diamonds, sapphires, garnets, amethysts, emeralds, and rubies. Of articles made of the precious metals none are more elaborate or richly wrought than rice and betel-nut dishes for domestic use, and the bowls which the Siamese present to their priests as propitiatory offerings. From Northern Siam are bowls of delicate workmanship, engraved with the figures of animals, from which are named the Siamese cycles, each of a dozen years. Among the wealth of illustrative material may also be mentioned mattings, screens, priestly fans, made of the leaves of the sacred poh tree, rich embroideries, silks and satins, sets of Siamese money, beautiful caskets of filigree and mother of pearl, samples of chipped meats such as are eaten by the royal family, and plain specimens of native cloths, with models of looms and spindles. Finally, there are skins of the tiger, leopard, deer, buffalo, otter, armadillo, python, rabbit, rhinoceros, and other animals, illustrating the fauna of Siam.

Persian industries and Persian life are seen to better advantage in the Midway plaisance than in the small oriental pavilion adjacent to the Spanish section. Here, however, is a collection of native rugs and carpets such as was never seen before outside of Persia. For one of pure silk, with fifty-six square feet of surface, maroon and dark blue in color, and richly embroidered with flowers and figures of birds, \$15,000 is the price demanded. A Bokhara rug, with rich Oriental red ground, an India Cashmere rug, in green and red, with light-colored carpets of mixed Angora wool and silk, and a Samarcand carpet from Central Asia, are a few of the fabrics which cover the floor and walls of the Persian pavilion.

In the southeastern corner of the Manufactures hall is the Chinese exhibit, consisting of ivory carvings, silk fabrics, embroideries, porcelain ware, bamboo screens and fans, mattings, fire crackers

Manufactures hall. The floor is considerably elevated above the dais upon which it stands, is approached by two ornate stairways, and open on all sides, its sharp gables and slender pillars, being painted red and yellow, and decorated with pieces of glass and broken pottery. As remarked by a spectator, the structure resembles nothing so much as a large piece of jewelry, one of the settings of which is a pair of elephant's tusks, flanking one of the entrances, and curving gracefully from the floor to the sides of the pavilion for a distance of nine and a half feet. These were taken from a domesticated animal, and are among the largest in the world. Here also is a display of gongs, drums, guitars, violins, chimes of bells, harmonicas, and zithers, with models of Siamese houses, carved from wood beneath the projecting eaves, these, with the models of native boats, suggesting the city of Bangkok with her cumbersome river craft, and the half nautical life of her common people, for among



BULGARIAN SECTION



COREA EXHIBIT

and other miscellaneous articles. On account of the partial rupture of friendly relations with the United States caused by the exclusion act, China has sent us, not a representative national display, but rather one gathered together by a few wealthy Chinese who have business interests in this country. In the booth of a Canton merchant its wooden enclosure is decorated in the fashion peculiar to the Chinese, and fastened to it are tiny carvings of joss-houses, pagodas, dwellings, and shops, from the windows and doors of which protrude the most grotesque of figures. Gold, red, and green are the most prominent of the decorative colors. Within are some wonderful carvings in ivory, and sandal wood, beautiful silk embroideries for screens and dresses, ebony furniture gilded or inlaid, ebony or ivory boxes, and richly enamelled vases, one of the last made for the em-

peror Ching Tai, of the Ming dynasty, about four centuries ago. Side by side with a portrait of the merchant, is that of Lee Hung Chang, viceroy and statesman. In adjoining booths two other merchants display their specialties in ceramic wares and mattings.

Of the \$630,000 appropriated by the Japanese government, a considerable portion was expended on her exhibits in the hall of Manufactures, adjacent to the Austrian section; and here is sufficient evidence of the growing commercial intercourse between that country and the United States. Already the trade between the two countries exceeds forty-four millions a year in Mexican silver dollars, of which the exports from Japan



SIAM PAVILION

constitute over three-fourths; more than a quarter of her foreign, and nearly half of her total export trade, being with the United States. Among the main articles of export are porcelains, textile fabrics, metal, and lacquered wares, all of which are liberally represented at the Fair.

The display is, however, less unique than at the Centennial Exposition when for the first time was presented a complete collection of the native manufactures of Japan. Then it was that a great demand was originated for Japanese articles, especially in the way of ornamentations, one that even now is observable in many American branches of artistic manufacture. As a result, the simple characteristics of earlier Japanese work have become somewhat vulgarized; for the restless commercial spirit has seized upon Japanese and American alike, and lowered the former standard. Nevertheless there are many specimens representing the purest results of Japanese handicraft, so that the visitor may judge for himself as to the genuineness of what they have been taught to believe were true samples of Japanese skill and taste.

Among the best are the porcelains, of which a number of manufacturers have contributed beautiful specimens, some avowed imitations of the Chinese school, but, as is claimed, not fashioned merely from commercial considerations. Besides dishes, vases, and other articles, such as are usually composed of this material, there are busts and figures of Kaga porcelain, neatly molded and skilfully painted.

The portrayal of figures in porcelain is something new to Japanese art, and a feature of additional interest is that the pieces represent with considerable fidelity of delineation, such personages as Columbus, Washington, Lincoln, and Grant. By a secret process the gold and colors used are so absorbed as to be virtually embodied in the work.

Another variety is the cloisonne ware with its metallic enamelling, than eight feet high, and among the The process of manufacture requires enamelling often requires several thoroughly polished after each firing. signs representing the four seasons, threatened annexation of Corea by

of which there are two vases more finest examples of Japanese art. no little patience and skill, for the applications, and the pieces are Upon these vases are elaborate designs and such political events as the China or Russia. Flowers, birds, snow scenes, eagles and domestic fowl, are interwoven in intricate fashion, while the crysanthemum and kiri blossoms, national symbols of Japan, appear between the rising sun and the American flag, indicative of the cordial relations existing between the two nations. On the stand of keyaki wood, on which they are mounted, are reproduced in carvings seventy distinct varieties of flowering plants.

Mounted on a pedestal at the northern end of the section is a marvel of imitative workmanship in the form of an iron eagle, two feet in height and five between the tips of the wings, each feather, of which there are several thousands, being separately traced, and containing as many as a thousand lines. Here was a five years' continuous task, and in order to make a perfect model, the artist secured two eagles, one of which he stuffed, keeping the other alive that he might watch its movements. Among the carvings in bronze, the most noticeable are those which show the native falcon in a dozen lifelike forms, and suggest the sport derived by the ancient daimyos of Japan. Of carvings in wood, there are many specimens, one of the most striking of which is a model of the famous pagoda at Kioto, known as Yasaka, and destroyed by fire many years ago. The original was a piece of hand carving in wood, as is the model, the latter requiring the services of thirty-seven skilled workmen for an entire year.

Most of the articles in wood and ivory carvings are of ingenious design, in striking contrast, as are the



JAPANESE VASES



ceramic wares and mosaics, with the crudity of much of the workmanship now palmed upon the public as of Japanese production. An attempt to check this imposition has been made by the government art school in Tokio, from which many delicate carvings have been sent to the Fair. In the line of decorative metal work, also, the government illustrates the skill of native artificers with specimens of artistic handicraft from leaders in that specialty. There is, for example, a rich piece

of chisel work in the form of a plaque, made of a mixture of gold, silver, iron, and copper, upon which figures are engraved representing a flock of herons, with effects of light and shade unknown to western artists.

As a rule, Tokio furnishes the best of artists and artisans, which, by the way, in Japan and the east, are much more nearly synonymous terms than in the United States. Lacquered wares are seen in quaint and beautiful forms, and there are gold boxes covered with wrought flowers and butterflies, writing-cases covered with marine views, toilet sets, fans, tables, and an endless variety of useful and ornamental articles in such profusion as to forbid a description in detail.



JAPANESE BRONZES

Of silks, embroideries, tapestries and ornamental needle-work there is a choice display, and especially is this exhibit an illustration of the facility with which the Japanese adopt the best features of the products of other nations. Many years ago, one of the most skilful weavers in Japan was so impressed with the beauties of the French Gobelin tapestries that he commenced to copy them for the benefit of his countrymen. Competent judges of his work,

as seen at the Fair, now assert that the texture of these tapestries is finer and more durable

than that of the true Gobelin, while there are depicted scenes from national life with an accuracy of detail beyond the best efforts of western masters. The principal work represents one of the religious celebrations held annually at Nikko; a temple with surrounding structures and foliage, and a procession of some 1,500 figures, the entire scene, as to architecture, costume, perspective, and atmospheric effects, as clearly presented as though depicted on canvas. Upon rich velvets are also views of the eastern empire, interior sections of Japanese houses, and other specimens of art in which the work of the dyer, the artist and the manufacturer seem merged in one. In embroideries and pieces of pictorial needle-work many are almost as ambitious, but, although the results are usually more gorgeous than in the products of the loom, they fall short of them in artistic qualities.

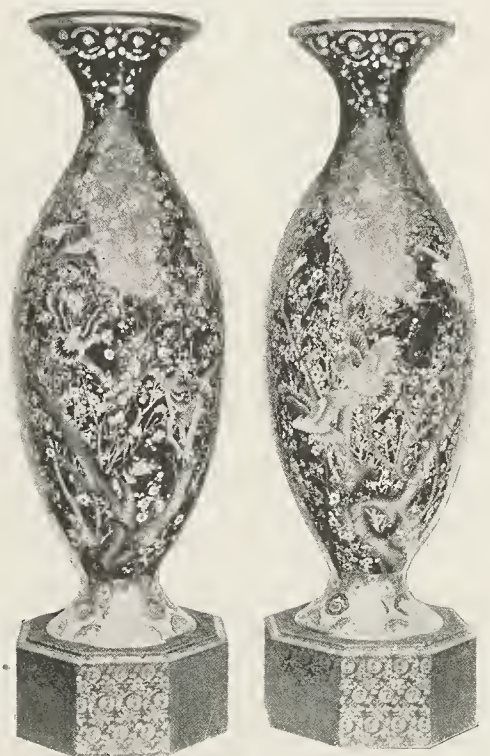
In the Japanese pavilion there are specimens of nearly every class of

manufacture, from the art works which we have noticed to toys, walking sticks, paints, dyes, varnishes, drugs and stationery. But the chief inter-

est centres in the articles which tend to beautify the interior of homes, or to ornament their pleasure grounds. No feature in the exhibit attracts more attention than the model Japanese house, with its screens, its light and simple furniture, its silk drapings, lacquer and gilt ornaments, vases, and household implements and decorations. Here are real



JAPANESE SECTION



JAPANESE VASES



ARTHUR RENWICK



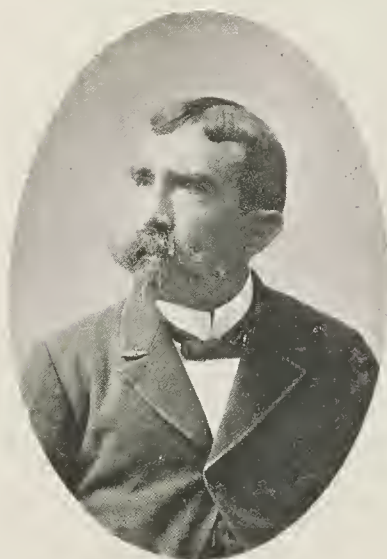
MANUEL M. DE PARALTA



H. GUZMAN



JAMES PERRENOUD



FRANCISCO E. BUSTAMAULE



PRUDENCIO DE MURGUIONDO



ARTHUR LEFFLER



MARQUIS ENRICO UNGARO



J. J. GRINLINTON

FOREIGN COMMISSIONERS



JAPANESE CHINA

floor are the largest horse and alligator skins that have ever been tanned, each thirteen feet in length, and mounted with the head of the animal from which it was taken. California has a structure of walrus hide, inlaid with many varieties of leather; Mexico, a unique display of furs and skins, and the central figure of the Brazilian group is a mammoth globe, covered with samples of rough leather. There are calf skins almost as soft as silk, kangaroo skins, an elephant's hide with a surface of more than 300 square feet, and cases filled with chameleon, lizard, and anaconda skins from Latin America and Asia. On the walls are displayed the horns of animals which furnish the raw material of the leather industries; of stuffed specimens there are enough to stock a museum, and here and there are niches filled with such curios as a milk bag of goat-skin from Jerusalem, a water bag from Jaffa, and the head of an Amazonian Indian, with bones removed, leaving only the shrunken flesh and cuticle. But of the primary descriptions of leather, one of the finest specimens is in the form of a belt 200 feet long and twelve in width. In belting and sole leather, New York, Pennsylvania, California, and Ohio are especially prominent, the American Oak Leather company, of Cincinnati, furnishing a striking example of the uses to which the heavy grades may be put, in its pavilion of grained leather, closely resembling black oak and mahogany.

But foot-wear leads all the other classes, the factories of America competing with those of France in

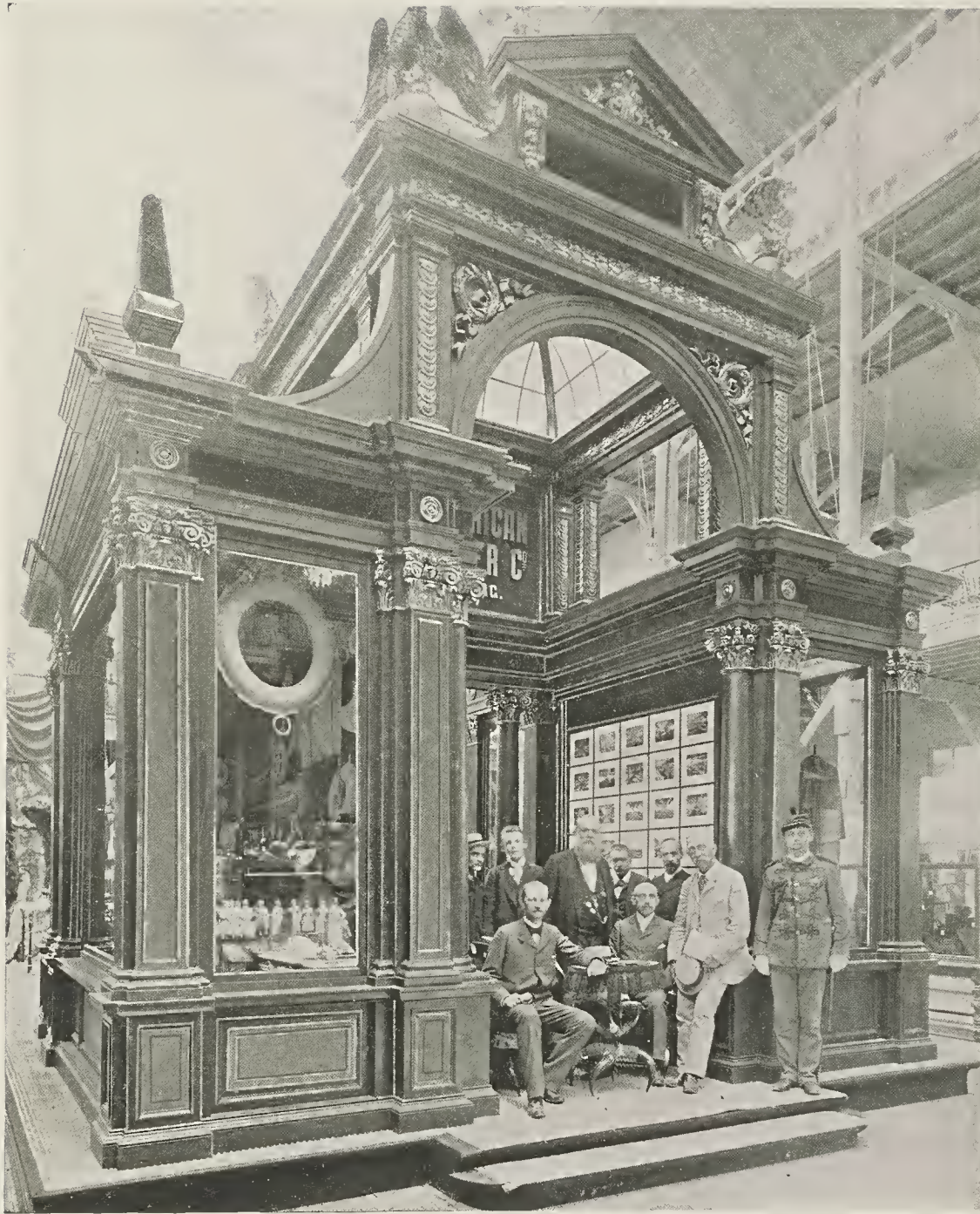
Japanese apartments furnished by the most competent of native artists, so that those who would see for themselves the homes of the wealthier Japanese can find no better opportunity than is here afforded them.

In addition to the home and foreign manufactures already described are certain collections classed under that department, but housed in separate buildings, either through lack of space or for other reasons that need not here be mentioned. These are the Shoe and Leather, the Merchant Tailors', and the Krupp exhibits. The Shoe and Leather building is a plain, substantial, two-story structure, suggestive of an eastern factory, and as it would seem, somewhat out of place in its location by the lake front, near the convent of La Rabida. Of the \$100,000 subscribed for the erection of this edifice and the organization of its exhibits, about sixty per cent was contributed by the New England states, largely by Massachusetts. Of the total exhibiting space, 15,000 square feet in the centre of the building were allotted to foreign participants, mainly to France and Russia, both of which nations have furnished an elaborate display. On the ground floor, in addition to foreign exhibits, are collections of leather and leathern goods. The galleries are filled with the best and most recent machinery, some of it in operation, for the manufacture of various grades of shoes; and there is a model factory in running order, with a capacity of a thousand pairs a day.

Among the more striking exhibits on the ground



JAPANESE SECTION



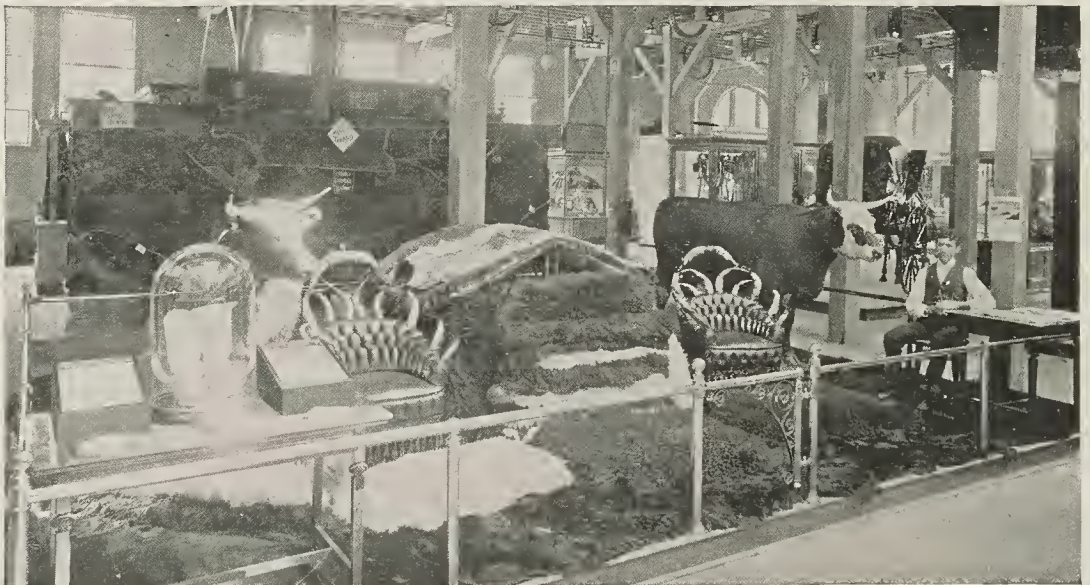
POSING FOR PHOTOGRAPH, SHOE AND LEATHER EXHIBIT

the finer grades. There are shoes made of alligator skin, of buffalo, and horse hide; there are heavy Russian boots, with wooden soles, and solid, spiked shoes from Switzerland; there are dainty kid shoes of many buttons, and satin slippers from Spain, with numberless varieties and grades from France and the United States. Of morocco and dongola goods France and Germany have each a choice collection, while the United States excels in patent and enamel shoes. On the walls are several hundred water colors, representing the various styles of foot-wear used by the leading races of the world for three or four thousand years, with cases filled with models adapted to all climes and nationalities. Among them are velvet-lined shoes for dainty Burmese ladies; shoes with turtles' claws protruding from the toes, such as are worn by the African savage; the huge wooden clogs that the Dutchman wears; pattens with stilts attached for Japanese tea pickers; embroidered shoes with toes upturned for the Chinaman and Corean, and shoes lined and tipped with fur for Swedes and Russians, the scented jeweled slipper of the harem favorite, and the sandal of the Egyptian water carrier; all these with foot-wear

for every people under the sun, from the Eskimo to the Patagonian, and from the Laplander to the Persian.

In decorative leather work the Russian exhibits contain some remarkable specimens. Harness leather in black, buff, and russet colors, is shown in a variety of forms by most of the participating countries, and from Cape Town comes a collection of trappings used by the Boers, together with a number of leather ornaments culled from Zulu territory. There are Chinese swords, with carved or stamped leather hilts; Moorish scimitars and Soudanese swords and daggers, decorated with leather; Zulu shields of rhinoceros hide, and leather war belts from Abyssinia studded with precious stones, and scarred with the marks of battle.

South of the Illinois state building is a miniature reproduction of the Acropolis, with the orthodox porticos in front and rear, and with broad stair-ways leading to the water's edge. Approaching this classic structure, the visitor inquires as to its uses, expecting perhaps to find there a collection of works of art, and probably the



EXHIBIT, SHOE AND LEATHER BUILDING



MODEL OF FACTORY

by-gone days, so graphically depicted by Charles Durand.

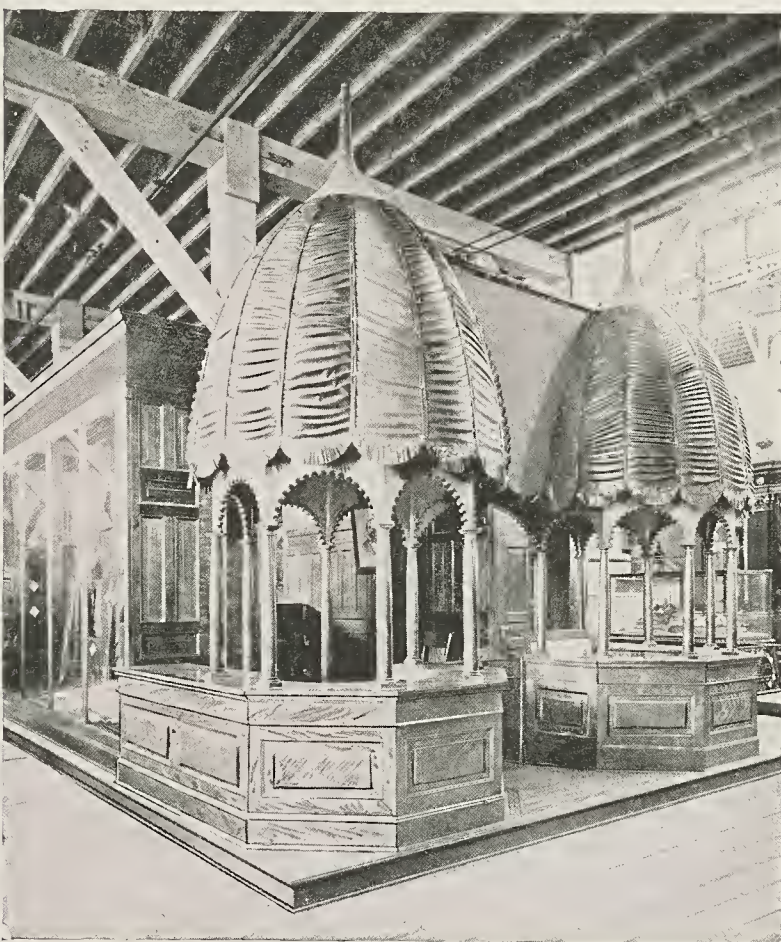
Surrounding this circular court, laid in light colored mosaic, are rooms designed for business purposes or friendly meetings; but the tailor's pavilion is not merely a resort for members of the craft with their friends and families, for here are many typical exhibits, including, as an illustration of the perseverance and ingenuity of olden days, a colored cloth, hand stitched, and made of nearly 6,000 pieces of tailors' goods. Neither stitch nor seam is in sight, and to complete this remarkable specimen of workmanship was the eight years' task of its artificer. On wire frames and wax dummies are displayed the styles of costume prevalent in social, court, and military circles. Here, for instance,



BRAZILIAN SECTION, SHOE AND LEATHER BUILDING

last that he thinks of is the purpose to which it is put, for here is the Exposition home of the merchant tailors of the United States. Entering this pavilion, of which the interior is finished in cream and gold, and with appropriate mural decorations, we read on the panels of the rotunda the following biblical inscriptions: "And they sewed fig leaves together, and made themselves aprons." "Unto Adam also and his wife did the Lord God make coats of skins and clothed them."

On the dome above, supported by Corinthian pillars, are paintings representing the evolution of the tailor's art, beginning with Adam and Eve, in primitive attire, and then the barbarian, somewhat more advanced in costume, followed by the Egyptian, the Greek, the citizen of the renaissance period, and of the cra of Louis XIV—XVI, and so on up to modern styles of dress. In one of the mural paintings is the scene in a tailor shop of



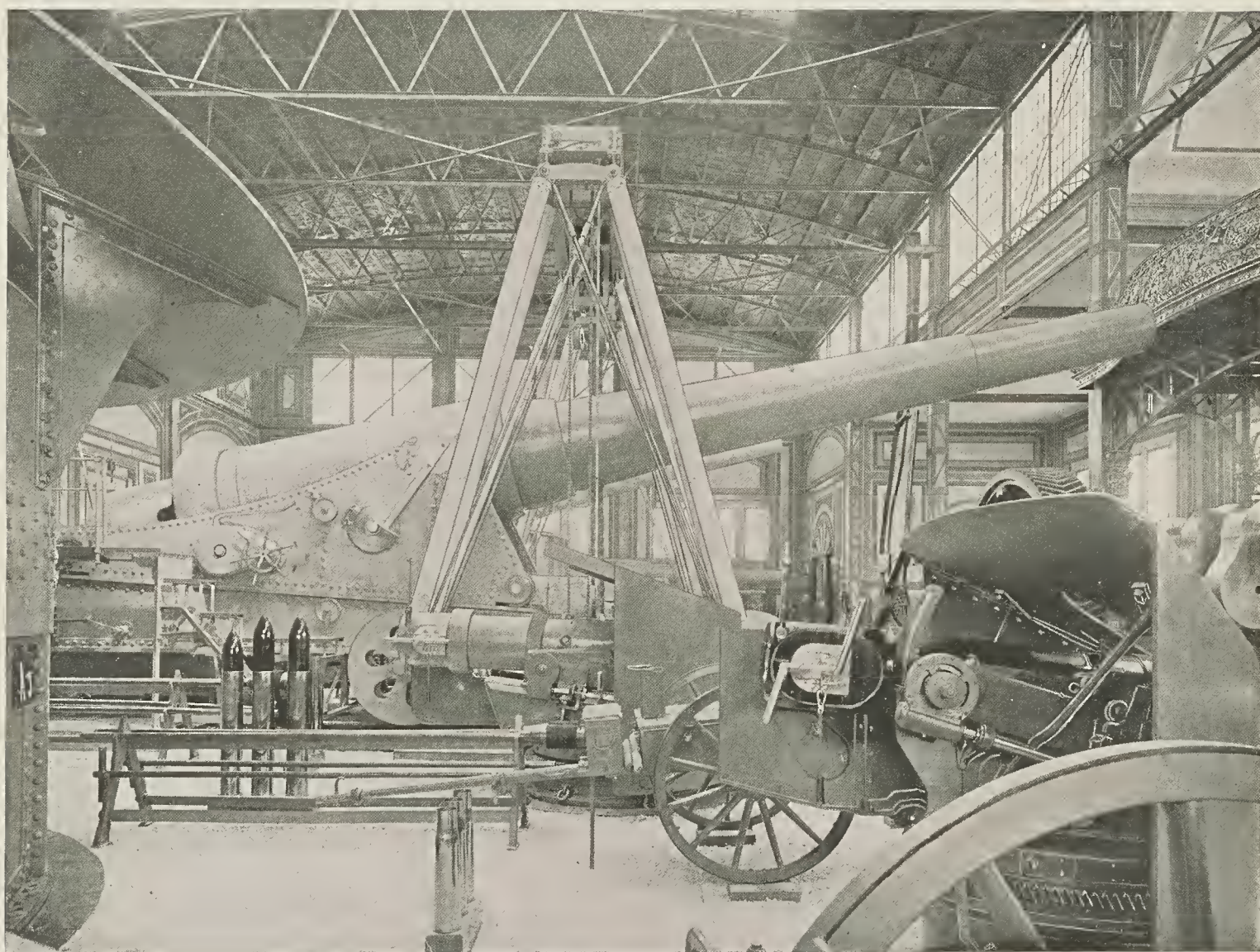
SHOE AND LEATHER PAVILION

are the tailor-made trappings of Queen Victoria's ladies-in-waiting; the liveries of her coachmen, and the uniform of General Miles, with business, dress, and other suits, reversible garments, and costumes decorated with devices suggested by the Columbian anniversary.

On the lake shore, south of the convent of La Rabida, is a castle-like structure, with towers at either end, typical of the Fatherland, and on its eastern side a tower decorated with the shields and coats-of-arms of the several German states. Here is the exhibit of guns and missiles, mammoth and miniature, manufactured at the Essen works of Friedrich Krupp. Extending along the western wall of the pavilion are sixteen monster guns, with their cavernous muzzles pointed lakeward. The giant of the group, protruding from the centre of the array, was installed in its position after



KRUPP BUILDING GERMANY



INTERIOR KRUPP BUILDING, GERMANY



MERCHANT TAILORS' BUILDING

upward at an angle of forty-five degrees and then can see only its under surface, supported on a carriage of massive and complex design, and around it the steam and electric appliances whereby is brought into play its awful potency for destruction.

Around the great guns are their projectiles, by the side of which are thick plates of armor, torn like folds of paper. Beneath the monster weapon, the largest in existence, is a tiny gun which has seen service in the hands of an African bushman, and near by are the smallest of mountain howitzers, such as may almost be carried by a man, and are often strapped to the backs of mules.

The eastern portion of the building is devoted to such exhibits as the prow, rudder, shaft, screw, and other metallic portions of a modern steamer, with a shaft ninety feet long and three

in thickness. There are also steel driving-wheels for locomotives, and protective plates for the bows and sterns of merchant vessels. In a word there are few articles of steel, whether pressed or forged, such as are used for protective purposes, which have not a place in the collection, for in these works are more largely produced the means of defense than the engineering of destruction. On the walls are photographs and paints of the Essen fac-



WHALER "PROGRESS"

tory, and in the office are models of the ancestral home of the Krupps, and of the monument erected in honor of the late Alfred Krupp through the voluntary contributions of officials and workmen. In the centre of the pavilion are the so called glacier fountains, cooling the atmosphere, and serving as a relief to their sombre environment.

Finally there is a wrought-iron balcony, designed and executed by citizens of Düsseldorf, from which is an excellent view of the building and its contents.

WORLD'S FAIR MISCELLANY.—Of the 16,500,000 feet of lumber consumed in the hall of Manufactures and Liberal Arts, more than 3,000,000 feet were for the flooring and underpinning, and the foundations of the girders, the remainder being principally used for the galleries. All of it came from the Northwest, except 4,000,000 feet of Southern pine. The main floor is two inches thick, and the floor of the galleries one inch. Both were so constructed as to withstand five times the pressure to which they would probably be subjected, mainly with a view to prevent the vibration apt to occur in a less solid building. No danger is apprehended from tornadoes, every pillar in and under the building having a separate foundation, so that it is prepared for the fiercest storm to which the land is subject.

For lighting the Manufactures building there are used five electroliers, suspended longitudinally 60 feet from the roof, and 140

an eventful journey, attended by special envoys, and hauled through several states on a car made specially for the purpose.

In this weapon it would almost appear that the limit of size and carrying capacity had been reached; yet many a time before has this been vainly predicted. To say that the gun will throw as a projectile for a distance of twelve miles a solid ton of metal, that to start this missile on its way requires a quarter of a ton of powder, that the gun itself weighs 101 tons, affords but a feeble description of the great leviathan of war.

From the floor of the building we look



INTERIOR MERCHANT TAILORS' BUILDING

feet from the floor, the central one fitted with 102 powerful arc lights, and the others with 78 lights, each of 2,000 candle power, making in all 414 arc lights and 828,000 candle power. There are additional lights for the aisles, loggias, galleries and inner spaces, supplementing the main system and giving stronger emphasis to the grand proportions of the building. For the great search-light on the northwest corner, already mentioned, it is claimed that a newspaper can be read by its light at a distance of eight miles. The apparatus, which is eight and a half feet in height, includes a mirror, ground and polished on both sides, and a lamp operated by electric motors placed under the platform.

Around the edge of the main semi-circular roof is a promenade, nearly a mile in length, reached by elevators running to a platform beneath, from which a stairway leads to the roof. Here the city of the Fair and of Chicago may be viewed from a height of 240 feet,

and on a clear day the cities on the opposite side of Lake Michigan are distinctly visible.

The work of installing the exhibits in the Manufactures building was finally completed on the 17th of June, on the evening of which day a reception was held, with formalities suitable to the occasion. For two years the chief of this department, James Allison, labored without ceasing to insure its success, finally "presenting, under one roof," as he says, "in a congruous, comprehensive and representative series of exhibits, the results achieved in most of the great divisions of human industry and ingenuity."



The following regulations, framed by Mr Allison, and approved by the director-general, apply also to other departments of the Exposition, in addition to the general regulations already mentioned. Exhibitors must be producers or manufacturers of the materials or finished goods intended for exhibition. All applications must be accompanied by a suitable diagram, on a stipulated scale, explaining the plan and distribution of the exhibits. No fire, inflammable oils, or other combustible materials would be allowed within the building. All designs for pavilions or other structures, and for platforms, cases, and partitions were subject to approval by the director-general; platforms to be not more than seven inches, and counters two feet ten inches above the floor, with railings two feet six inches above the platforms, all to be kept within the space

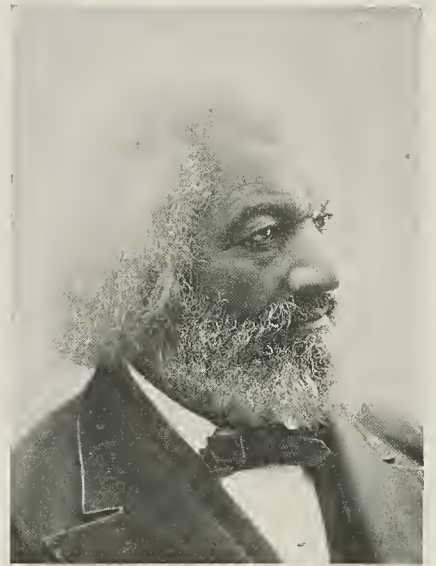
assigned to the exhibition. Signs must be so placed as not to obstruct the light or view, of uniform design, and must not be made of inflammable materials.

In one of the cases in the Tiffany pavilion is an interesting collection of precious and other stones, including the largest rock crystal found on this continent, and an engraved diamond, the only one in the United States, the cutting of which was performed at intervals extending over five years. The display of gems in this pavilion includes about 10,000 diamonds, and of pearls an unknown quantity, the latter valued at little short of \$400,000. There is also a complete assortment of precious and other stones, such as are used in the lapidarian art, from their crude state as contained in the matrix to perfectly cut and polished gems. At times are shown in practical operation the processes of cutting and polishing diamonds.

To the groups in the American section, consisting of woolen goods and mixed textiles, contained in square black cases of unsightly aspect, and contrasting somewhat sharply with the tasteful foreign pavilions on the opposite side of the nave, was given the name of the Undertaker's section of the Manufactures department.

Of gas stoves, apparatus, and fittings, there is a large display, though not so large as was anticipated, for it was the original intention to erect a separate building for the purpose. Two Chicago firms have an elaborate collection, including the latest devices in the way of burners for heating or manufacturing purposes, so constructed that gas and air form a clear blue flame of great power. There are also instantaneous heaters, of American make, attached to bath tub and other fixtures, and heating water to the boiling point in the briefest space of time.

The exhibit of shirts in the clothing group is mainly by New York manufacturers and the Zion's Coöperative Union of Utah. On this class of work sewing girls in the eastern states average only some \$5 a week, much of it being done by charitable institutions, while the shirt-makers of Utah can earn from \$8 to \$10 weekly.



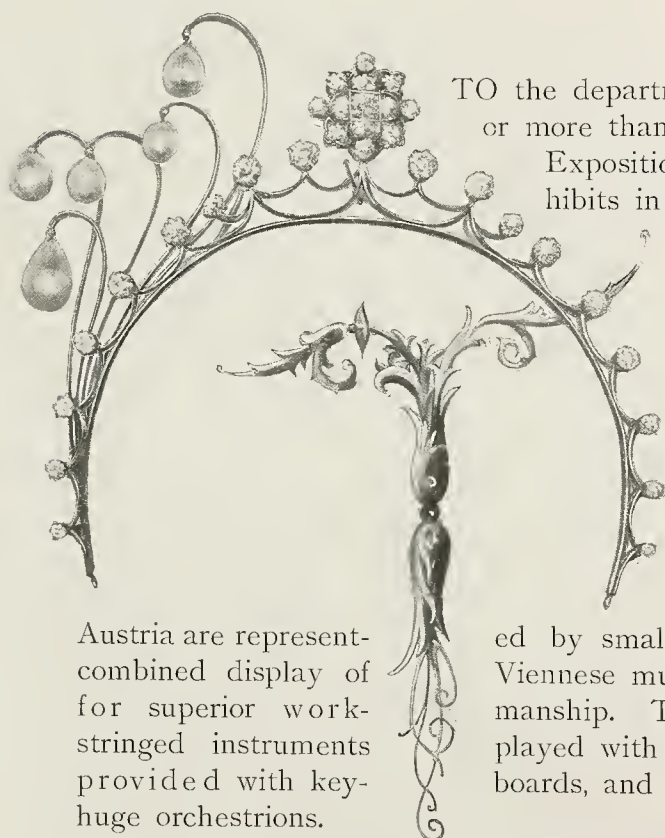
FRED DOUGLASS





CHAPTER THE TENTH

LIBERAL ARTS



Austria are represented by a combined display of for superior work-stringed instruments provided with key-huge orchestrions.

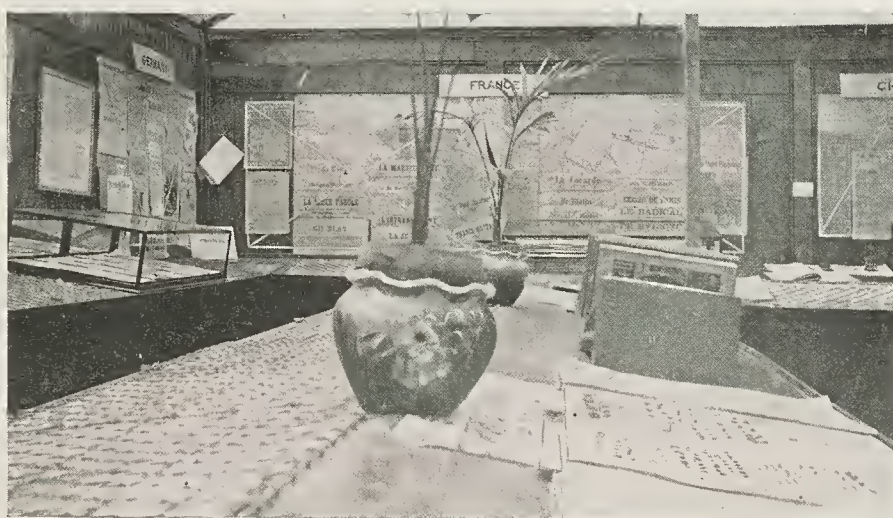
Chief among the historic groups, and indeed the only one that can be termed a purely historic collection, is that of L. Steinert, of New Haven, who exhibits, among other curios, Bach's clavichord, one of the earliest of keyed instruments, which gives forth a thin and feeble tone. The collection includes several specimens of old-fashioned harpsichords and spinets, among them Mozart's spinet, upon which he composed many of his grand sonatas. There is also Beethoven's grand piano of six and a half octaves, with frame of rosewood and hinges of brass. Near this is Haydn's piano in a white oaken case, of deeper and fuller tone than most of the earlier instruments.

TO the department of Liberal Arts was assigned a floor space of 400,000 square feet, or more than ten times the room allotted for similar purposes at the Centennial Exposition. It was at first intended to place the exhibits in the southern end of the hall of Manufactures, and about equally divided between its ground and gallery floors. But as finally arranged, the only group on the main floor is that of musical instruments, which occupies nearly 70,000 feet in the south-eastern portion. Here is a large and varied display of organs and pianos, fashioned by some of the foremost makers in the United States, with historical collections and handsome pavilions devoted to special exhibits, national and individual.

Of foreign powers only Russia and ed by small exhibits, the Austrian collection forming a Viennese musical manufactures, among which the zithers are especially noticeable manship. The entire department has many specimens of self-vibrating pieces; of played with the fingers and the bow, as banjos, guitars, harps, and violins; those boards, and wind instruments, from simple fifes to complicated orchestral pieces or



SELIM H. PEABODY



THE OLDEST PAPERS IN THE WORLD

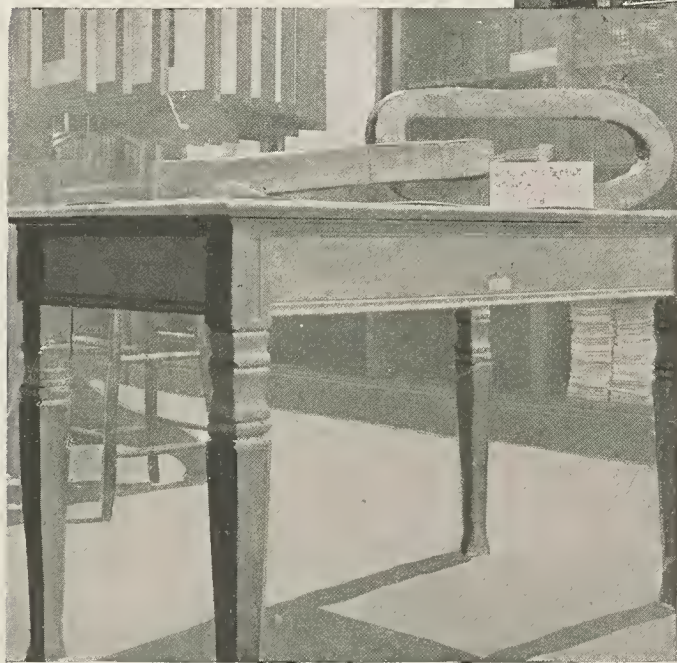


VIEW FROM GALLERY OF MANUFACTURES BUILDING

from forest woods in the Adirondacks. In their pavilion are also illustrated the various processes in the manufacture of felt, from the raw material to the finished product. A Boston house exhibits in the way of musical specialties pianos, cabinet organs, and Liszt, or chapel organs, one of the last decorated in white and gold, and its pipe top representing the Bay State capitol on Beacon hill. But the largest collection is that of a Chicago firm, in whose two-story pavilion, decorated in terra cotta and gold, are many rare and costly instruments. One division is filled with harps of massive workmanship, highly polished and ingeniously decorated, ranging in value from \$700 to \$2,200. In an adjoining case are dainty



ORGANS AND PIANOS



CHAIN ACROSS THE HUDSON AT WEST POINT, 1778

Other interesting relics are an eighteenth century harpsichord, with double board and keys of tortoise shell and ivory, its case profusely decorated with floral designs, and a piano built in London in 1776 for Martha Washington.

The exhibits of the United States cover the entire range of musical appliances, including not only all modern instruments, but their accessories, and the materials of which they are made. New York manufacturers display, for instance, felts, hammers, wheels, discs, and cones, with spruce sounding-boards made

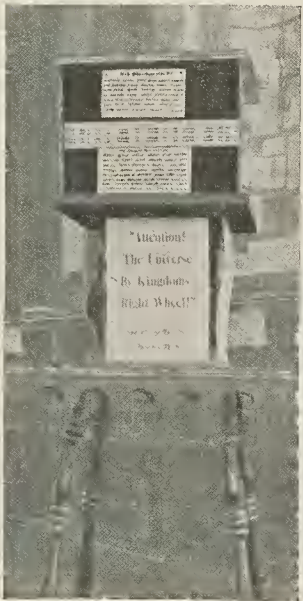
mandolins and guitars, one of the latter a Stradivarius of the date of 1680, for at times the great artificer fashioned other musical instruments than violins. In an adjoining section is an array of banjos, and elsewhere are bass drums, and huge batons with massive heads of gold and silver. Together with the drums and batons is a strange looking stringed instrument, the body of which is a large bamboo. This is a reproduction of the mahati, or great vina, one of the favorite instruments of Upper India during the thirteenth century. In this pavilion a winding stairway leads from the main exhibits on the ground floor to a small recital hall above, where daily concerts are given by performers on the harp and guitar.



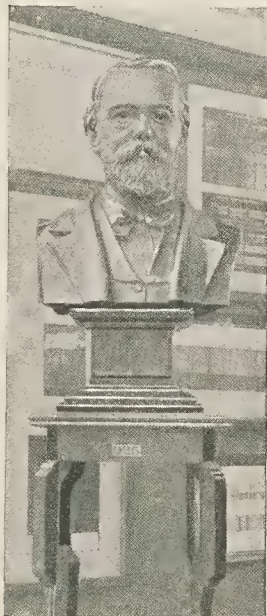
CONGREGATIONAL CHURCH

But the bulk of the musical exhibits, and the choicest specimens of mechanical and artistic workmanship, are found in the hundreds of pianos, which testify more than all else to the growing tastes of a music loving people. Mahogany, rosewood, satin wood, ebony, cedar, oak, ash—all the cabinet woods of the tropic and temperate zones—enter into their construction. Some are enamelled; some are finished in white and gold; others in ebony and gold; many being elaborately carved, though not a few are merely painted by hand. In style of architecture they differ almost as widely as the homes of the Fair, and this remark applies also to the organs, of which there is a choice collection.

To the educational groups were assigned about 175,000 square feet, including the entire southern aisle of the gallery, and a portion of the eastern and western aisles adjacent. Here is probably the most comprehensive



FIRST TELEGRAM



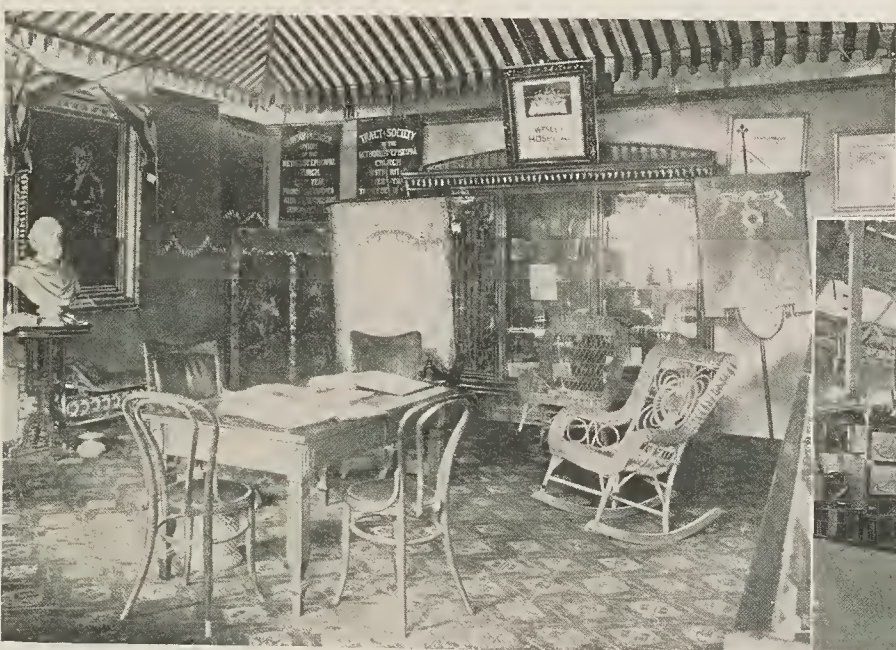
JOHN DRAPER



LUTHERAN HEADQUARTERS

collection of the kind ever brought together, including specimens, descriptions, apparatus, models, and programmes pertaining to every grade and class of education, from the kindergarten to the university, and to schools of medicine, law, and the mechanic arts. To these groups more than thirty states and territories have contributed, with several foreign powers, and some fifty universities and colleges; but of the four acres or more of educational exhibits therein contained, only the more salient and interesting features can here be noticed.

In the sections occupied by the United States is fully illustrated the progress of



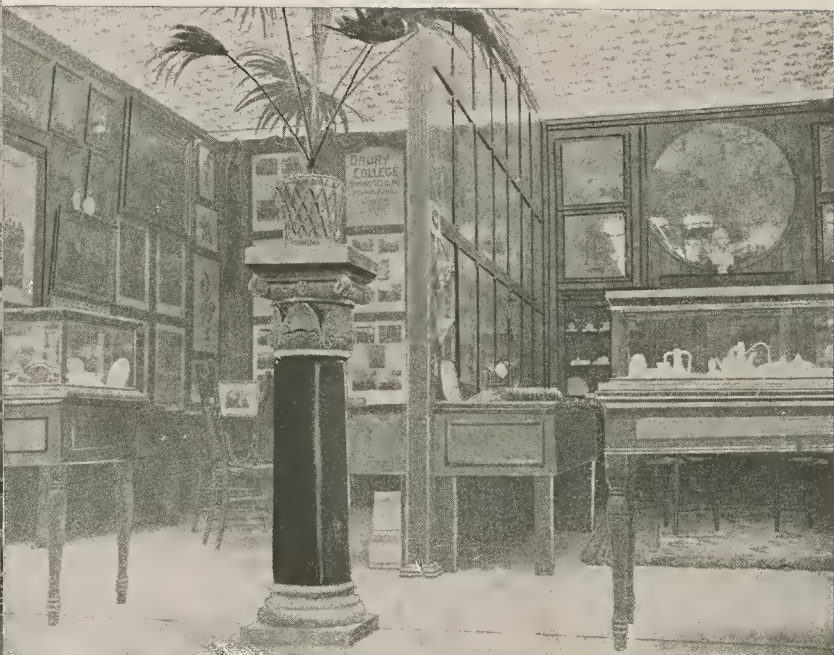
METHODIST HEADQUARTERS



EPISCOPAL CHURCH EXHIBIT



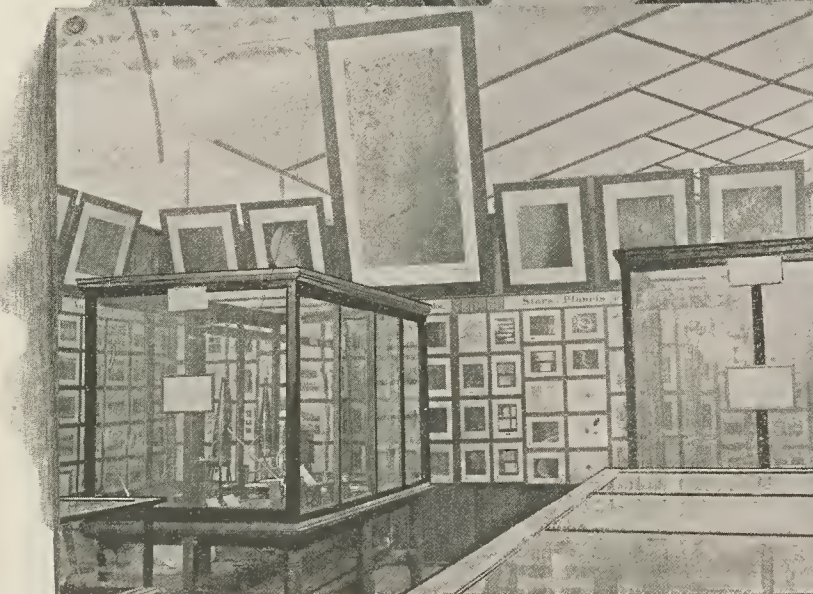
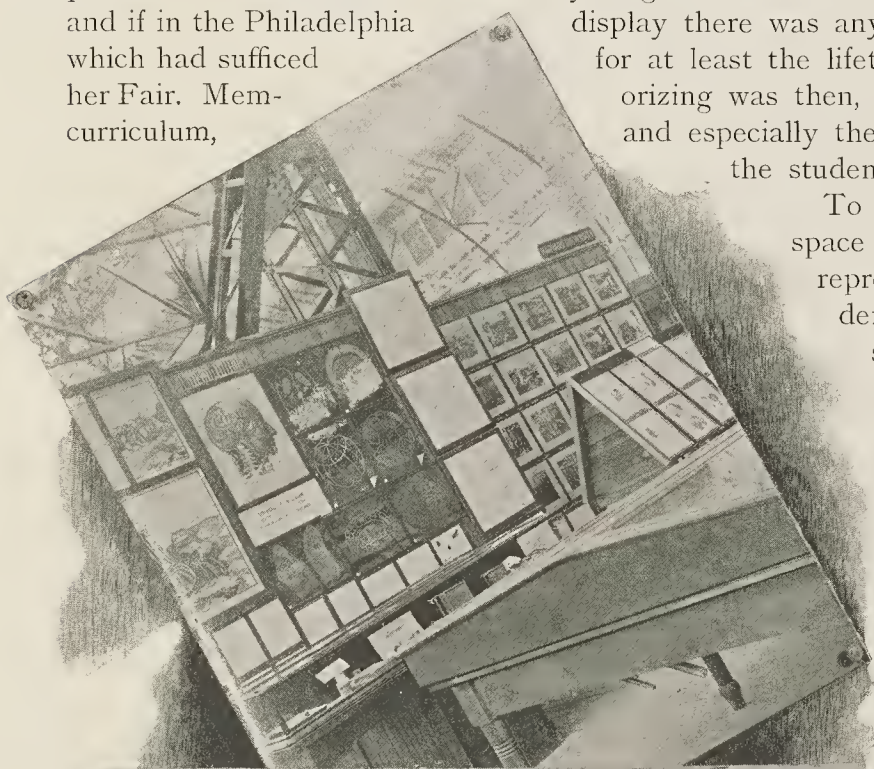
YALE UNIVERSITY EXHIBIT



MISSOURI UNIVERSITY EXHIBIT

educational science within the brief span of years that have elapsed since the opening of the Centennial Exposition. The kindergarten or play-school system which Friedrich Froebel introduced in Germany, well nigh half a century ago, was then in its infancy. As to the Pestalozzian system there were few, even among professional teachers, who knew anything more than its name. Manual training schools were almost unknown, and if in the Philadelphia display there was anything suggestive of methods more advanced than those for at least the lifetime of a generation, it is not recorded in the annals of orizing was then, as to-day it is, an all too prominent feature in the and especially the memorizing of rules which, on leaving school or college, the student will surely make haste to forget.

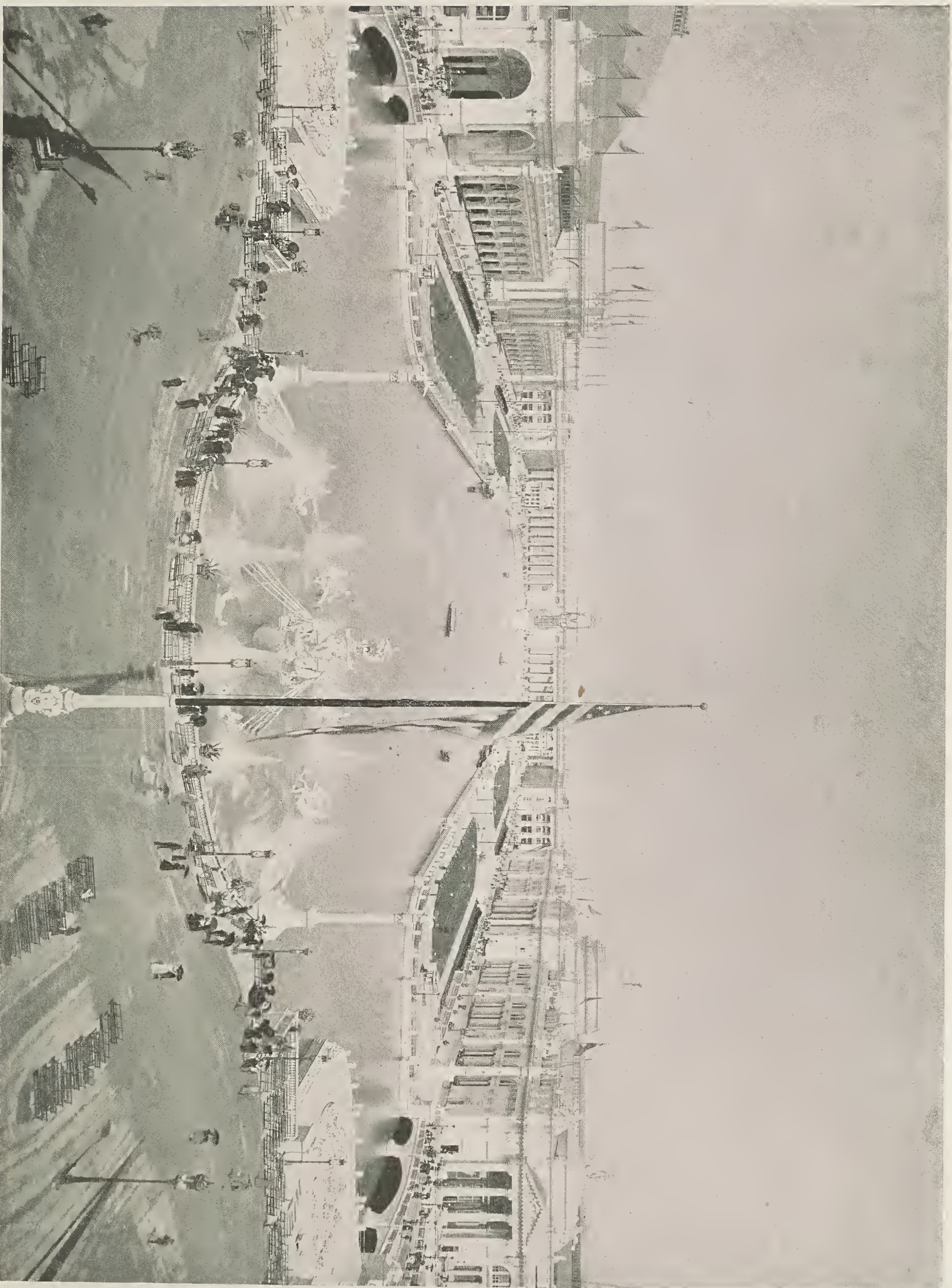
To each of the exhibiting states is allotted a separate space in the group to which it belongs, and where are represented not only its public school system, but its denominational, normal, scientific, technical, and other schools and colleges. There are also collective exhibits showing the organization and management of school libraries, of commercial and industrial schools, of schools where trades are taught, and of institutions for the deaf and dumb, the blind and feeble-minded. A feature of the entire display is the specimens of handwork, with drawings and maps, essays and answers to given questions on subjects assigned to the pupils of participating institutions, thus showing the achievements and acquirements of their alumni, as the result of scholastic training. Statistics are



HARVARD COLLEGE EXHIBIT



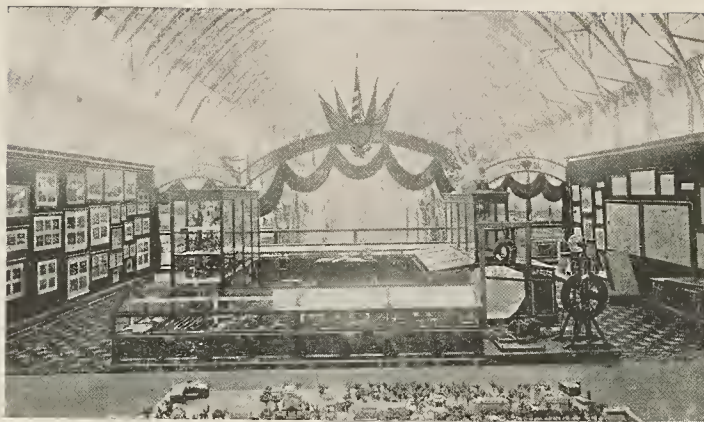
JOHNS-HOPKINS UNIVERSITY EXHIBIT



GRAND BASIN FROM ADMINISTRATION TOWER

presented both in the form of school populations, the secondary, and superior education, and other data in

Of the fourteen million represented in the educational about one-tenth belong to the was allotted a liberal space gallery, and thence northward in a parallel line with the Massachusetts section. On a chart fourteen feet square, made by the pupils of the Albany high school, are portrayed in attractive form the school statistics of New York. Of the products of her manual training schools there are selected samples. In 150 phonographs may be noted the various systems of singing as taught in as many schools. Of kindergarten specimens there is a large collection, especially from Rochester, Buffalo, and Albany, with photographs showing the



of text and diagrams, showing ratios of elementary, cation, race, sex, attendance, this connection.

pupils and 400,000 teachers exhibits of the United States, state of New York, to which in the southern aisle of the



PRINCETON COLLEGE EXHIBIT

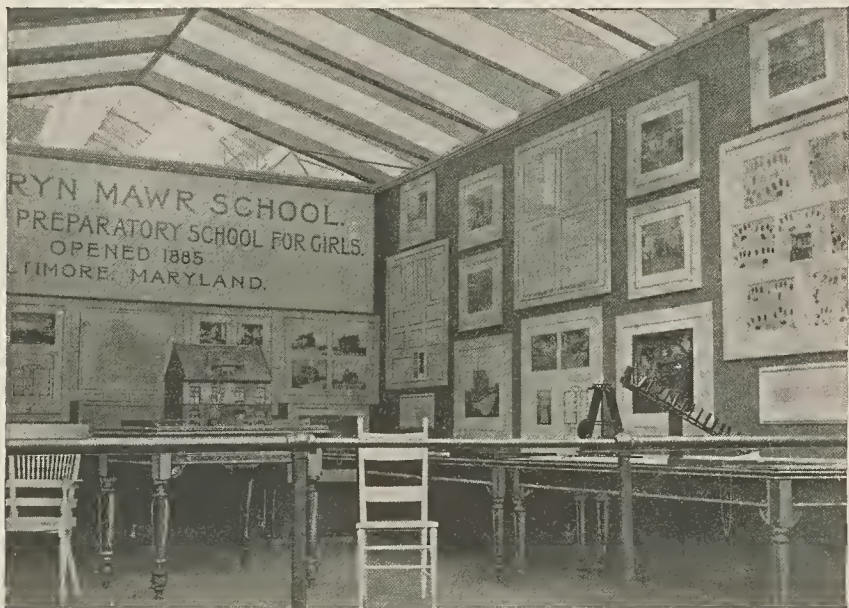


OBERLIN COLLEGE EXHIBIT

children at work or play. Beginning with the best work of the primary grades, we come to that of the intermediate grades, and then to the exhibits of high schools and academies, culminating with those of Columbia college and other institutions in which are represented our higher system of education.

Founded in 1784, the state university has no counterpart in this republic, for with it are affiliated some 500 colleges and academies, and in its system are included the state library, the state museum, and other libraries and museums admitted by the regents to association. The university of the city of New York has on exhibition the publications of the faculty for the past sixty years, among them the works of John W. Draper, whose *History*

of the Intellectual Development of Europe has been translated into a score of languages. There are also scientific apparatus invented by the professors, with charts and papers illustrating their methods of teaching and examination. Of special interest is a photographic portrait of Draper's sister, taken by the historian



BRYN MAWR SCHOOL EXHIBIT



UNIVERSITY OF CITY OF NEW YORK

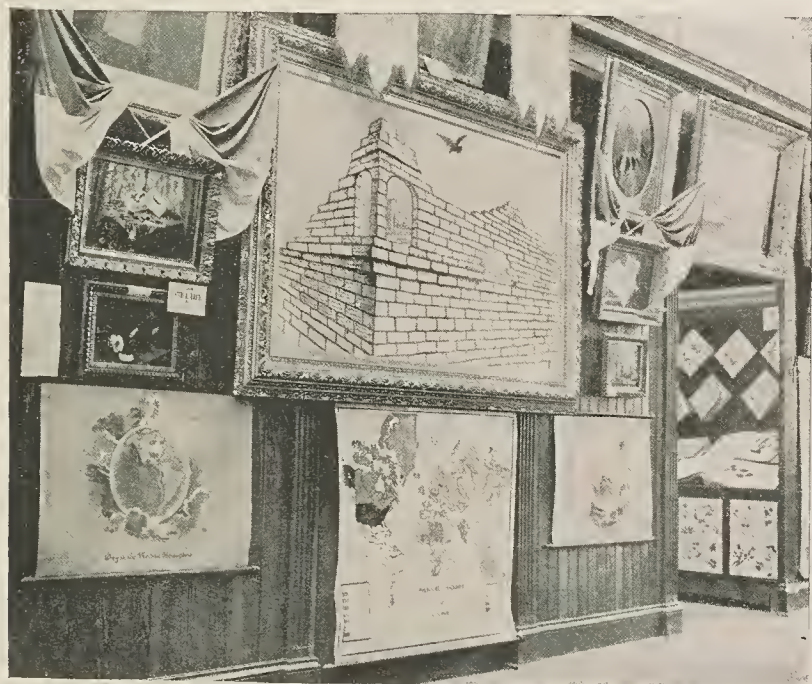


POPE LEO

cannot be purchased for gems or gold. In this allusion to university and college displays, the term is here applied to such institutions proper; for in the United States the word college is of wide application, and in these booths is a vast range of illustrations, from theses in Latin and Greek to plates showing the relative values of lucerne and oaten hay.

In connection with these exhibits may be mentioned that of the College fraternity, whose site in the north-west corner of the gallery is marked by a reproduction of the Choragic monument

of Lysicrates. The side walls of the pavilion are in imitation of ebony, with gilt ornamentation; and here are the badges characteristic of the so-called Greek letter societies. In bookcases is contained the literature of the fraternity, in the form of bound volumes, magazines, and college annals, and under the clear-story window included in their space, are portraits of their prominent men, with charters, symbols, and historic documents.



UNIVERSITY OF MILWAUKEE, CATHOLIC

in person, presented to Sir John Herschel, and recently found among the posthumous papers of the great astronomer. This is probably one of the oldest of existing photographs of the human face. Another curiosity is the original battery used by Samuel Morse, fashioned in the room now occupied by the junior class of the University law school. On the label of the case which contains it is the following extract from an address delivered by Morse at a meeting of the alumni in 1853: "Your Philomathean hall—the room I occupied—that room in the university was the birthplace of the recording telegraph."

To the Massachusetts section many cities and towns have contributed, forming a complete illustration of her educational methods and results. As in the New York and other sections, the public-school exhibits lead up to and are connected with those of higher institutions of learning, at the head of which is the university; for such is the system generally adopted by exhibiting states. Of the elaborate collections of Harvard, Yale, Princeton, and other universities and colleges, grouped as many of them are in proximity, it is unnecessary here to make other than passing mention. They include among their exhibits, pictures, diagrams, and models of their buildings and grounds, their museums, libraries, laboratories, and assembly-halls, with college and other publications, and with portraits of professors and alumni who have won for themselves distinction and repute. There are also manuscripts, missals, charters, and other documents in the original or in fac-simile, with relics and curios that



CATHOLIC HEADQUARTERS

Near the Massachusetts section, and extending thence westward along the southern aisle, are the groups of other New England states, each with a characteristic display. A feature in their collections, and especially in the Connecticut section, is the sewing work represented in articles of attire or domestic use, most of it the handiwork of girls under twelve years of age. Except for New York, Pennsylvania has the largest collection among the middle states, and one of excellent quality, for her educational system is on a par with her material greatness, as is attested by the superior workmanship and finish of her specimens. New Jersey has a compact and skillfully combined exhibit, with many original and suggestive features.

Ohio is mainly represented in the separate exhibits of three of her principal cities, Cincinnati, Cleveland, and Toledo, these being the only instances in which city schools occupy a prominent place. Missouri, with her ample school fund, has a good display of educational work, with a chart showing the location of her



HUMAN BRAIN

high-school building completed in 1892 at Colorado springs. California and Oregon are strongly represented, the former by an elaborate and the latter by a compact

exhibit of school and college already been said will serve to of their display. There remains, largest of all the educational exhibit, occupying 29,000 square gallery. To gather and classify three years' task, and as the attractive features in the de-attractive to all classes of vis-ect. In no sense of the word tion; nor is it in the nature of so far as it represents the education of its people, forming the church has done and is tion. In a word it is what it school and college exhibit under

At a meeting held in which time, it will be remem-assume tangible shape, the States, with Cardinal Gibbons vitation to the principals of all to aid in preparing and organ-liminary arrangements were Bishop Spaulding accepting the Maurelian the office of secre-mission. Then quietly and with such good will that in the completed collection are represented nearly all their educational establishments throughout the republic, with many beyond the seas. In addition to the exhibits of parish schools, academies, colleges, and universities, are those of normal schools, of schools of science and technology, of commercial, industrial, and



NORWAY SNOW SHOES

school-houses, and filled with statistical and other information. In Louisiana's exhibit is fully illustrated the progress of the southern states, New Orleans contributing the bulk of the collection. Minnesota's section is arranged with a view to artistic effect, and of special interest are the specimens from the manual training schools of Minneapolis, Duluth, and Stillwater, and those of children's sewing which St Paul and Minneapolis have furnished. In the booths of Iowa are maps, drawings, photographs, statistics, and other collections in which are portrayed all the branches of her educational system. Colorado, though one of the youngest of the states, has furnished sufficient evidence that she is one of the most progressive in educational, as in other matters. In addition to numerous articles of school-work, the artistic qualities of her school architecture is shown in photographs, and there are models of the first school-house and the new



EDUCATIONAL EXHIBIT, NORWAY

manual training schools, of schools for negroes and Indians, of kindergartens and orphanages, and of benevolent and reformatory institutes.

Almost in the centre of the group is a statue of Archbishop Feehan, carved in Carara marble, and of chaste and elegant design. This was presented by the priests of the diocese of Chicago, and on the pedestal is inscribed beneath his name the simple legend: "The Protector of our Schools." Around it are arranged in booths the exhibits of the various dioceses of which nearly all the principal schools are represented. The collections include every



BENJ. FRANKLIN'S ELECTRIC MACHINE

systems, appliances, and results. states and territories, what has indicate the general character however, to be described, the groups, that of the catholic feet in the eastern aisle of the this collection was almost a result we have one of the most partment of Liberal Arts; itors, whatever their creed or is this a sectarian demonstra-a religious propaganda, except influence of the church on the a material exposition of what doing for the cause of educa-pretends to be, and that is a catholic auspices.

Boston in July, 1890, about bered, the Exposition began to archbishops of the United at their head, extended an in-catholic institutions of learning izing the exhibits. The pre-made in Chicago and St Louis, presidency, and Brother tary and manager of the com-steadily they went to work, and



GERMAN SECTION



BUST WILLIAM III, GERMANY

description and grade of educational work ; but with no distinctive classification of the various grades, as in those of the public schools. Of parish schools several hundred are here represented, the dioceses of Chicago, Philadelphia, and Buffalo having the largest number. Add to these the exhibits of higher institutions of learning, and of industrial, charitable, and reformatory institutes, and some idea may be formed as to the magnitude of the display, representing, as it does, the aggregate results accomplished by all the numerous orders of priesthood and sisterhood, to whose care are intrusted the educational interests of catholic America.

Among the more interesting exhibits is the display of industrial work, not arranged, as elsewhere, in separate groups, but in the booths of the several dioceses, where side by side are specimens from schools of technology, orphan asylums, and reformatory schools ; for in these classes of work the church makes no distinction. In certain of the booths, however, there are special displays, as in that of the St Nicholas reform school at Paris, where are musical instruments, tapestries, laces and draperies, silver-plated ware, and decorative articles in bronze and copper, all these and others the handiwork of the



STATUARY AND PAINTING, GERMANY



GERMAN KINDERGARTEN

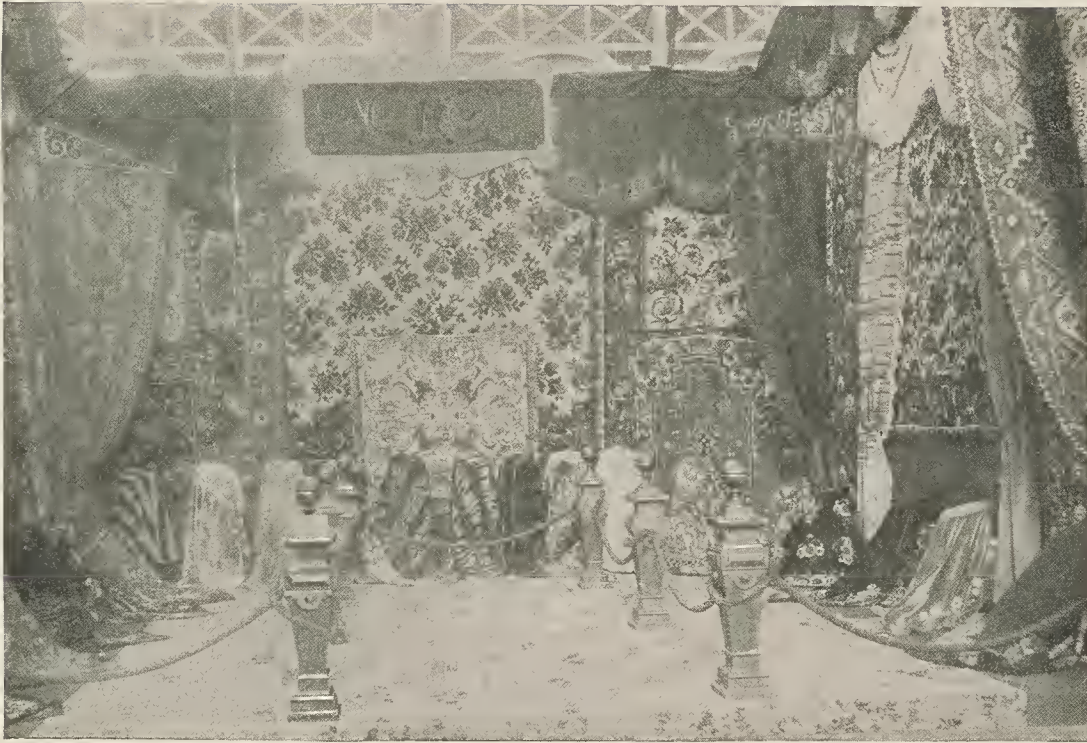
pupils. Several booths are filled with samples from a New York orphanage, including, among others, wood-carvings, mechanical drawings, metal-work, and brush and rope making. And so with the diocesan collections, for in most of the dioceses are similar asylums, and one or more industrial and manual-training schools.

Of school and college buildings, with their chapels, classrooms, lecture-halls, libraries and grounds, there are many drawings, paintings, and photographs. In graphic art are also represented groups of students and teachers, of music and sewing classes, and the workshops of training and industrial schools. Of paintings on porcelain, of free-hand crayons, mechanical and perspective drawings, and drawings from nature, there is a large collection, together with maps and hypsometric models of cities and countries. Printing and type-writing, plain and ornamental, electrotyping, carpentry, shoe-making, tailoring, needle-work, wax-work, as well as other useful arts and industries, are represented in the catholic exhibit.

Elsewhere in the educational section are the special exhibits of industrial and training schools, art and medical schools, business colleges, asylums, and other institutions not connected with the catholic church. Among the training schools represented are those of Chicago, St Louis, Cincinnati, Baltimore, and Toledo, the Carlisle Indian school, and the Hampton Normal and Agricultural institute for Indians and negroes, the two last pleading in silent eloquence for these wards of the republic. Worthy of note are the leather manufactures in the form of harness, satchels, trunks and shoes, and the carved and inlaid wood and cabinet work.



ADOLPH WERMUTH



CARPETS AND RUGS, GERMANY



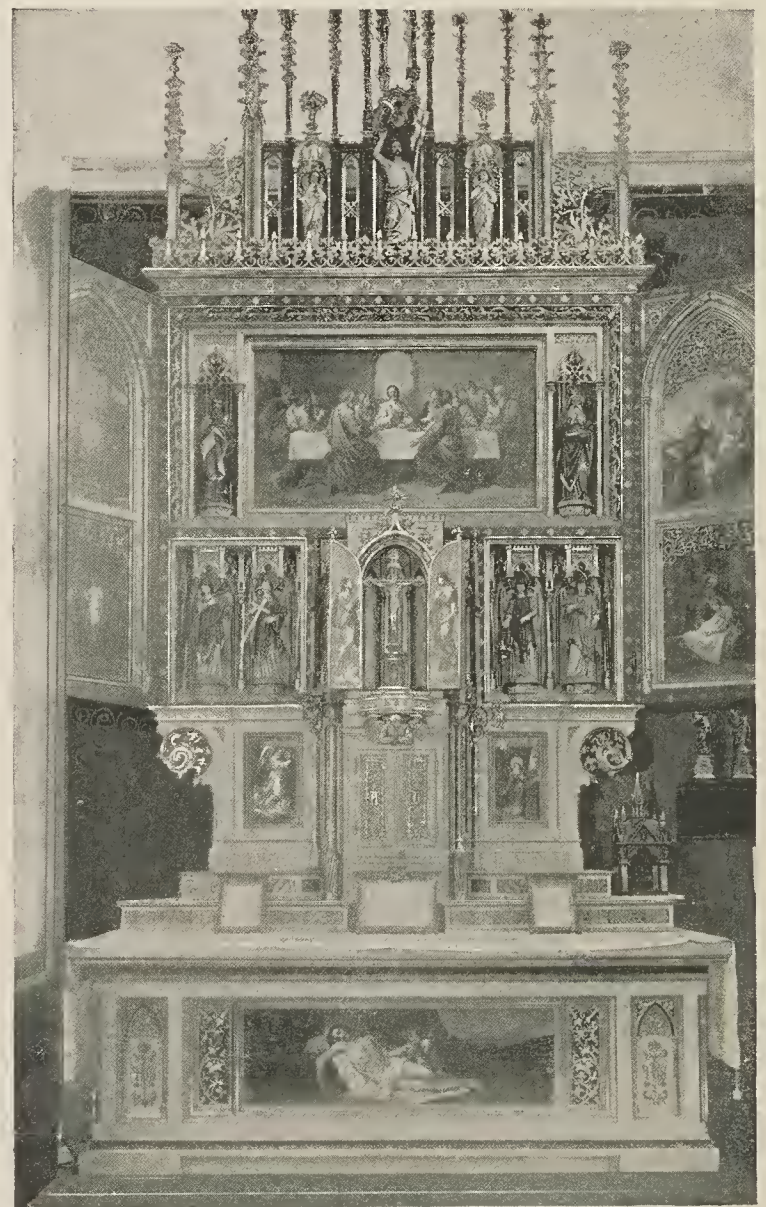
STAINED GLASS

The groups representing asylums for the deaf, dumb, blind, and feeble-minded form an elaborate display, and one in which are fully illustrated the most humane and intelligent methods of treatment and training. Manual work of a rough description the visitor would probably expect to find among the exhibits of schools for the blind; but to see there printed publications, free-hand drawings, and the finest of crochet work is somewhat of a surprise. A Washington institute for the deaf has contributed a replica of the monument erected at the national capital in honor of Gallaudet the elder, by whom was founded in Philadelphia the first American institute for deaf-mutes. Even from insane asylums are specimens of useful workmanship, for in such are not a few possessed of the rational faculty in greater degree than many outside their walls.

Among the art institutes represented in this department are those of Chicago and St Louis, the Cooper union, the Boston museum and the New York art students' league, while Pennsylvania has also collections from her museum, her academy of arts, and her Philadelphia school of design. In all these exhibits are illustrated by specimens the several courses in drawing and designing, together with systems of instruction, and their results in the competitive display of classes and pupils. In the medical section are the exhibits of eclectic, homœopathic, pharmaceutic, and other colleges.



ALTAR, GERMANY



ALTAR, GERMANY



PALACE OF MANUFACTURES AND LIBERAL ARTS

The principal business colleges of the United States, apart from those under catholic auspices, have a collective display in the western gallery, with specimens of penmanship, stenography, and telegraphy, together with a class-room in actual operation, showing the workings of such institutions. Finally in the exhibits of Wellesley, Mount Holyoke, and other colleges and seminaries, together with those of several art schools, is represented the education of women.

Among foreign powers Germany has the largest of the educational exhibits, in her 22,000 square feet of space in the western gallery. And here in truth is a display well worthy of a country famed for her thorough and scientific system of education, one in which the student may read that system almost as thoroughly as though he had travelled thousands of miles to study it. In this collection is a complete and explicit demonstration of the methods employed in the various grades, with plans, illustrations, statistics, and such other data as may render those methods intelligible. There are maps showing the location of all the higher institutions of learning, with paintings, photographs, and models of German schools, and ical charts, some of them 400

side by side with those of modern date. The educational exhibits are classed in three divisions, in ing to public, normal, and high grades, to asylums, and to the these collections are specimens prepared for the purpose, but of what is being accomplished ments, including the manual school section are represented teaching methods, especially occupy an important place in also the annual reports of all ing, including those for 1892, oldest and most celebrated

But the most interesting of the universities, twenty in one-half of the space allotted in part of a special character, leading educational features, interest. First of all are large buildings, with elaborate plans the walls are portraits of emi- science, among them one of Alexander von Humboldt, of Kekule, and August Wilhelm Hofmann, from the royal library and national gallery of Berlin. Of autographs and autographic letters there is a choice collection, including those of Charlemagne, Louis the German, Karl I, Goethe, Schiller, Kant, Winkelman, and a despatch to the great ex-chancellor from Wilhelm I. On a fac-simile of a page in the church register at Bonn

is recorded the birthday of Beethoven; all these and other treasures from university and state libraries, which have contributed, in 3,000 handsomely bound volumes, the best works of German scientists, inventors, and discoverers, with all the leading scientific periodicals.

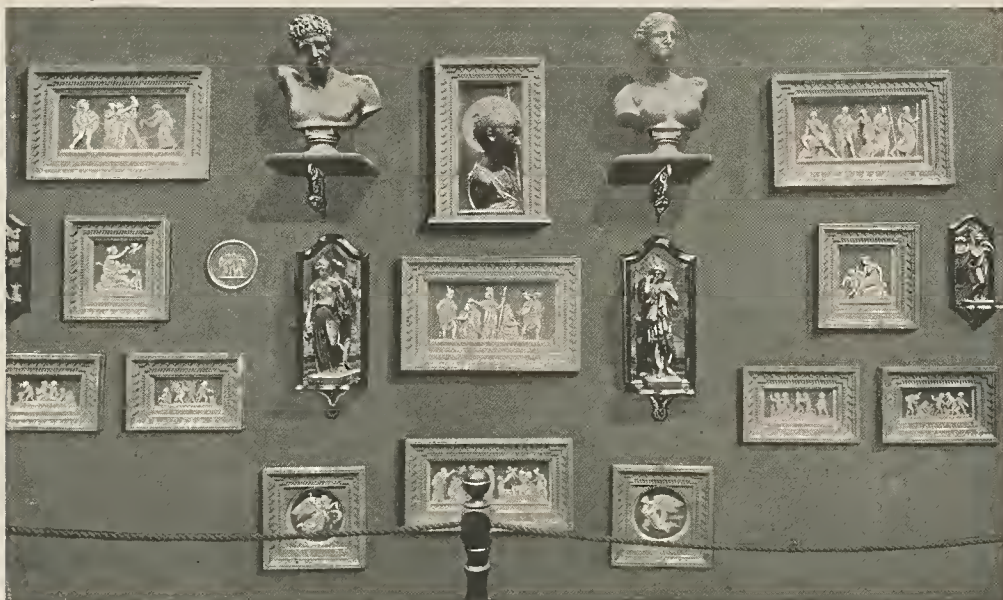
Together with models of ancient and modern laboratories and apparatus for scientific investigations are reproduced many of the principal inventions and appliances, including the telegraphic instrument fashioned by Gauss and Weber, in which is embodied Faraday's system of insulation, and the apparatus with which Kirchoff and Bunsen developed their method of spectrum analysis. There is also the first mirror which



DOULTON TERRA COTTA



ENGLISH CHINA



TERRA COTTA, BRITISH SECTION



CANADIAN SECTION

tion; in another is reproduced an operating and dissecting room, and a third consists of a food collection for army and other purposes where concentrated nourishment must be produced at the smallest cost. But of all the special exhibits, perhaps the most interesting is that of bacteriological specimens and apparatus by Robert Koch, with bacilli of all known varieties stored in glass cases, and the instruments with which



EDUCATIONAL EXHIBIT, NEW SOUTH WALES



CANADIAN EXHIBIT

Helmholtz constructed, and the air-pump which Otto von Guericke invented in 1650. A Guessfeld outfit includes all that is usually needed for scientific and exploring expeditions, and in botanical tables and charts is illustrated the mode of introducing and propagating exotic plants.

Of chemical specimens, small in size but large in number, there is a valuable assortment, mainly from the German chemical society, and so with mineralogy, zoölogy, and other natural sciences, most of which are here represented; but for the speculative sciences there is no place in the German section. A special exhibit by Rudolph Virchow, one of the foremost of pathologists, is in the form of a lecture hall, specially equipped for his purpose, and with a large anatomical collec-

they are detected and placed under the light of the microscope.

In connection with the German section may also be mentioned the display of scientific instruments by more than forty manufacturers, fully sustaining the high repute of German craftsmen in this direction. Among them are lenses of all descriptions and sizes, and in every stage of manufacture, from the rough pebble or glass to the finished article, with photographs from such as are used in that art, as nearly perfect as photographs can be. For these and for optical and surveying instruments, both of which are here represented, there is



STAINED WINDOW

the phrase public school is applied to Eton, Harrow, Rugby, and other endowed institutions, some of them founded in the fourteenth, and not a few in the fifteenth and sixteenth centuries. These and others established by religious denominations or through private benefactions,

were, apart from her universities and private schools, about all that England had to show in the way of education.

In the exhibits of the London school board are specimens of writing, map-drawing, designing, modelling, wood, iron, brass, needle, and kindergarten work, with school-books, materials, apparatus, models, and diagrams.

Some are framed or pasted on cards, and to others cards are attached with inscriptions, giving the names of exhibitor and exhibit. From the Whitechapel craft school are drawings and models illustrating the system of manual instruction. In the exhibit of the Oxford examination schools are portrayed the history and method of university extension. Trinity College,



FRENCH SECTION



DRAWING MODELS, FRENCH SECTION



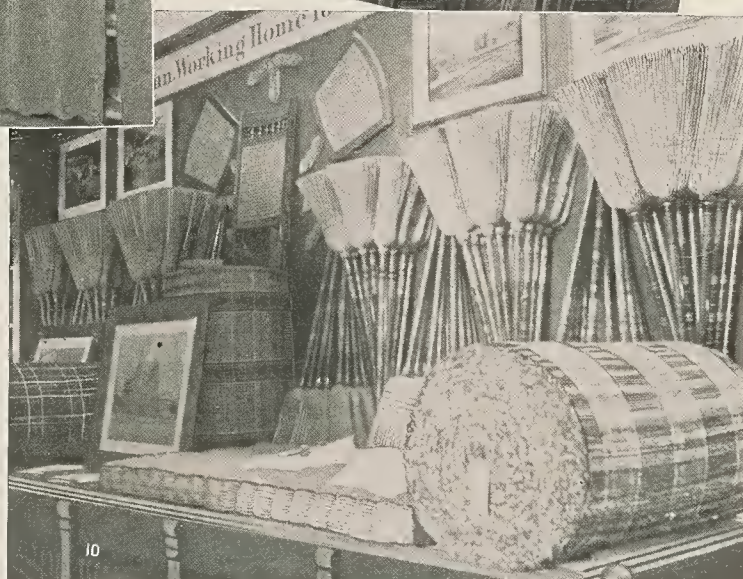
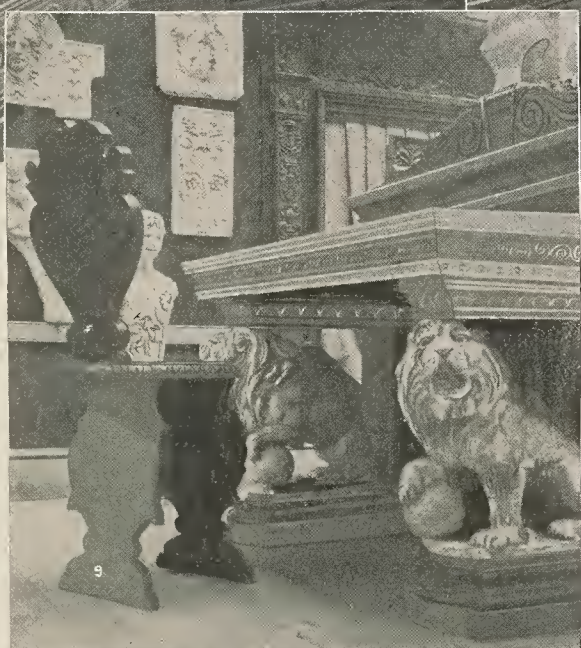
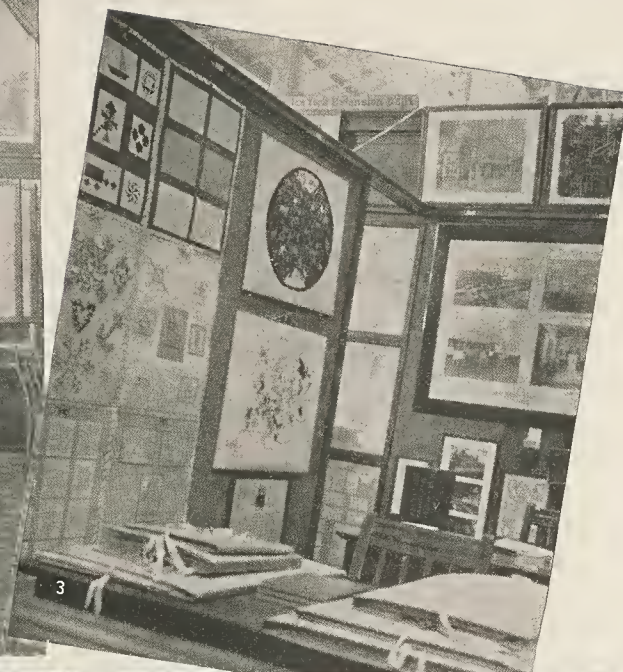
RENOMMEE PAR INGALBERT



STAINED WINDOW

Dublin, has a collection of anatomical models, and from schools of art are some of the drawings, paintings, models, and designs executed by their pupils.

In this connection may be mentioned the elaborate collection of photographs, adjacent to the educational display, in which are represented most of the prominent photographers of



1 SCHOOL FOR THE DEAF, MICHIGAN EXHIBIT

2 VASSAR COLLEGE, N. Y.

3 SECTION OF PRIVATE SCHOOLS, NEW YORK

4 PENNSYLVANIA SCHOOL OF INDUSTRIAL ART, WOOD CARVING

5 SCHOOL FOR THE DEAF, JAPAN EXHIBIT

6 BERLIN UNIVERSITY OF ANATOMY, GERMAN EXHIBIT

7 GERMAN AND ENGLISH ACADEMY, MILWAUKEE, WIS

8 SECTION OF GERMAN EXHIBIT, DR KOCH

9 PENNSYLVANIA MUSEUM AND SCHOOL OF INDUSTRIAL ART AND WOOD CARVING

10 PENNSYLVANIA WORKING HOME FOR THE BLIND

Great Britain. There are also engravings, etchings, and photogravures from art societies and art publishing firms and associations. Elsewhere in this section are specimens of book-binding, and an assortment of newspapers illustrating the development and characteristics of British journalism.

Canada is represented by the educational exhibits of the provinces of Quebec and Ontario, housed in cheerful and tastefully furnished booths. Here are contributions from some 200 of the principal schools, most of them under catholic auspices, and including all branches of education, from primary to high-school grades and special courses. Class-room work is freely distributed, with samples skilfully arranged, and displaying the aptitude and proficiency of the pupils. Of excellent



PEDAGOGIC MUSEUM, RUSSIA

quality are the relief-maps, the specimens of ornamental drawing and penmanship, and the embroidery and other needle-work, the last from the institutions of the sisters of Notre Dame. Elsewhere in this section, and of similar character, are the collections of secular schools and colleges, with representations of the educational systems of

the northwest provinces. In galleries of photographs are depicted scenes in the Rocky mountains, in Nova Scotia, and on the banks of the St Lawrence, together with the public buildings of Ottawa. Of musical instruments there is a small assortment, and the Scotch element finds expression in a display of curling stones of Toronto manufacture.

In the narrow space allotted to New South Wales are several hundred photographs in the highest style of art, portraying the history of Sydney, almost from the day when the British flag was unfurled on the shores of Port Jackson amid a group of naked, gibbering savages. Among them is one of the largest photographs in existence, reproducing the harbor of Sydney, one of the most beautiful in the

world, and the largest on the southern continent except for Hobson's bay where Melbourne sits enthroned, and in the centre of which its shores appear in faintest outline, even under the bright Australian sky. In other photographs are depicted the public buildings and statuary of the metropolis, her parks and pleasure grounds, with the mountain and river scenery, the forestry and agriculture of a colony almost equal in area to the entire Pacific coast. There are also collections of water colors, one representing the animals, another the birds indigenous to the country, and supporting the Australian coat-of-arms, over the entrance to the pavilion, are the



TRANSPORTING MAIL IN SIBERIA BY DOGS

largest kangaroo and the largest emu that could be secured and stuffed for the purpose. Of natural specimens there is a choice assortment, including birds of brilliant plumage, and the web-footed ornithorhynchus or platypus, with the bill of a duck, the eyes of a fish, and the fur of a seal. The Technological museum has a display of classified wools, and many varieties of timber and plants of economic value. For journalism a corner is reserved, while educational exhibits in the stricter sense of the

term are restricted to those of the public schools, and to specimens of work from the deaf and dumb institute under government auspices. The exhibits of France in the eastern aisle of the gallery consist largely of samples of work from her polytechnic and training schools, both of which are prominent features in the educational system of this country. The public schools are also represented, as are the commercial and night schools. All the exhibits are grouped



PEDAGOGIC MUSEUM, RUSSIA

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RUSSIAN TRANSPORT OF MAIL BY MEN IN CAUCASUS



BELGIUM



SWISS WOOD CARVING

with the true artistic taste of the Frenchman, forming, as a whole, a complete illustration of school life, with exercises and examinations, and with text-books arranged in regular order and adapted to every grade, from the primary school to the university.

But the most interesting feature in this section is a representation of the library systems of France, together with her stationers', book-sellers', and bookbinders' trades. Among rare and valuable works is De Lamennais' *Imitation de Jesus Christ*, its 102 quarto pages all decorated in different designs, with four large pictures from manuscripts of the thirteenth to the sixteenth centuries, and with ciselure work such as is found in the illuminated manuscripts of bygone ages. A priceless treasure is the

Heures, belonging to the first quarter of the thirteenth century, in small octavo on vellum, with French and Latin characters, and miniatures painted on gold ground in relief, all in the purest of classic style. Other curiosities are a reproduction in old morocco of Madame de Pompadour's writing-case, with flowers in mosaic; a prayer-book with borders, miniatures, and Gothic letters executed in silk; a *Livre de Mariage*, with bas-relief in carved ivory, and a card-case representing the finest cuir-ciselé work of the renaissance. Still another rare work describes the triumphant entry of Charles IX into his capital, and in *Ces Prêsentés Heures*, Paris, 1498, is a miniature figure of an angel, copied from the prayer-book of Anne of Brittany.

Under the auspices of the Cercle de la Librairie, founded in 1847 on the eve of the revolution, and including more than 400 members, a catalogue was specially prepared for the occasion, containing much that is of interest. Here may be read the history

of the more famous printing and publishing houses, one of them founded in the seventeenth and several in the eighteenth century; for in France a business, once fairly established, is often preserved in the family for several generations. Sixty of the members of this association are represented in the French section, and among their exhibits are many choice works, especially in *ouvrages de luxe*. Of these may be mentioned *Les Maîtres Florentins de XV^e Siècle*, with illustrations from original paintings and sculptures in the Thiers collection; the first of two folio volumes by Edouard Rouveyre, relating to the manuscripts of Leonardo de Vinci, with copies of the originals; Charles Blanc's *Histoire des Peintres*, and Le Vasseur's editions of Buffon and La Fontaine. Other editions de luxe are from a publishing house in Tours, whose establishment covers six acres in the heart of the city, and from which are issued several millions of volumes a year. Other publications



ANCIENT MEXICAN CARVING



BELGIUM

worthy of note are illustrated editions of Victor Hugo's works, one in forty-eight and another in seventy volumes, and those of Sir Walter Scott in thirty volumes, of which only twelve are on exhibition, with illustrations by the foremost of French artists, costing or to cost, when completed some twenty years hence, the sum of \$150,000.

Russia has much to show in her 1,000 square feet of gallery space, largely occupied by specimens from hundreds of orphan and other asylums with their hundreds of thousands of inmates. Among their specimens



JAPAN

of needlework is a beautiful piece of embroidery representing the arrival at Russian ports of American ves-

sels laden with grain. This is the handiwork of St Petersburg school-girls from twelve to fourteen years of age, and at the close of the Fair is to be presented, as a token of gratitude, to the wife of President Cleveland, while for the president himself was fashioned a mantel ornament in gold and silver thread, interwoven on a background of dark red silk. From national and private schools and other educational and charitable institutions are many collections, and especially from those under imperial patronage. In addition to samples of work are models, charts, statistics, and illustrations pertaining to matters educational throughout the broad realm of the czar. These, together with everything else contained in

the department of Liberal Arts, except for a few articles of special value, are to be distributed among the benevolent and other institutes of the United States.

Among the exhibits grouped in this section is that of the postal service, with life-sized figures of officials, and with mail-pouches littering the tables and floor as though cast aside by the carriers.

The carriers themselves are represented in realistic fashion by models and pictures, one travelling over the snow in a reindeer sledge, another in a cumbersome horse cart, and a third mounted on a camel, with others toiling afoot through rugged mountain passes, the entire group being intended to illustrate the difficulties connected with the service and the means by which they are overcome throughout the broad realm of the Russias, covering as it does one-sixth of the land surface of the globe.

The War department, in its several divisions, has also a liberal display, including plans of the military prison at St Petersburg, and of the corn granaries erected near Warsaw to be used as storehouses in case of siege. Then there are the uniforms and musical instruments of the various army corps, and books relating to the science of fortification and other branches of warfare. In charts are indicated the proportion of food elements in the daily ration of pupils of the military schools, and the stature of Moscow school children. The Pedagogic museum has models of the many ethnological types of which the population of the empire is composed,



HARDWARE AND PICTURES



PAINTED STATUE, JAPAN



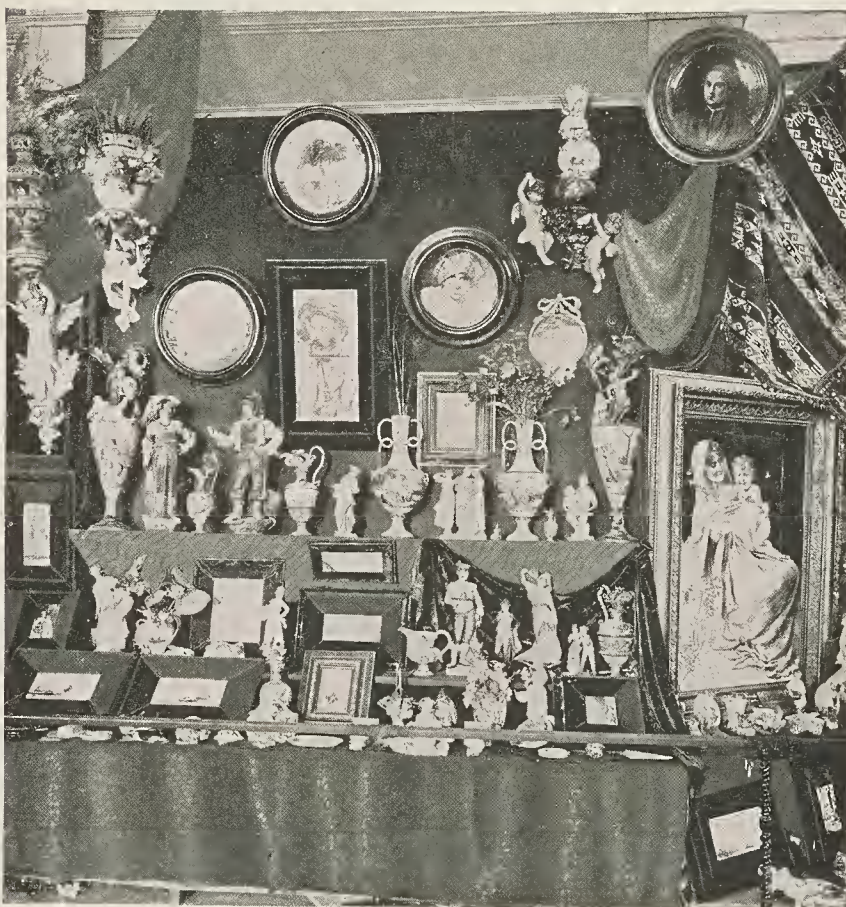
JAPANESE FURNITURE



TERRA COTTA, DENMARK



AUSTRIAN GLASS



ITALIAN SECTION



CHINA WARE AND LANTERNS, JAPAN



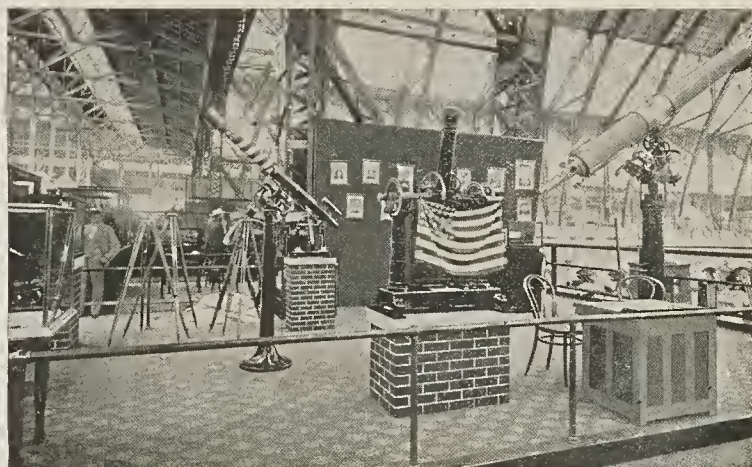
BELGIUM



ITALIAN SECTION

with cabinets filled with minerals, skeletons, and mounted specimens of animals and birds.

Austria has no educational exhibits, except for the models, school apparatus, and musical



TELESCOPE EXHIBIT

instruments, displayed by business firms. Italy has only a few educational publications and reports, and Belgium, a few plans and designs for school-houses, with a model of a school for basket-making, also from private firms. Denmark is represented by models, drawings, and implements from a Copenhagen society for encouraging



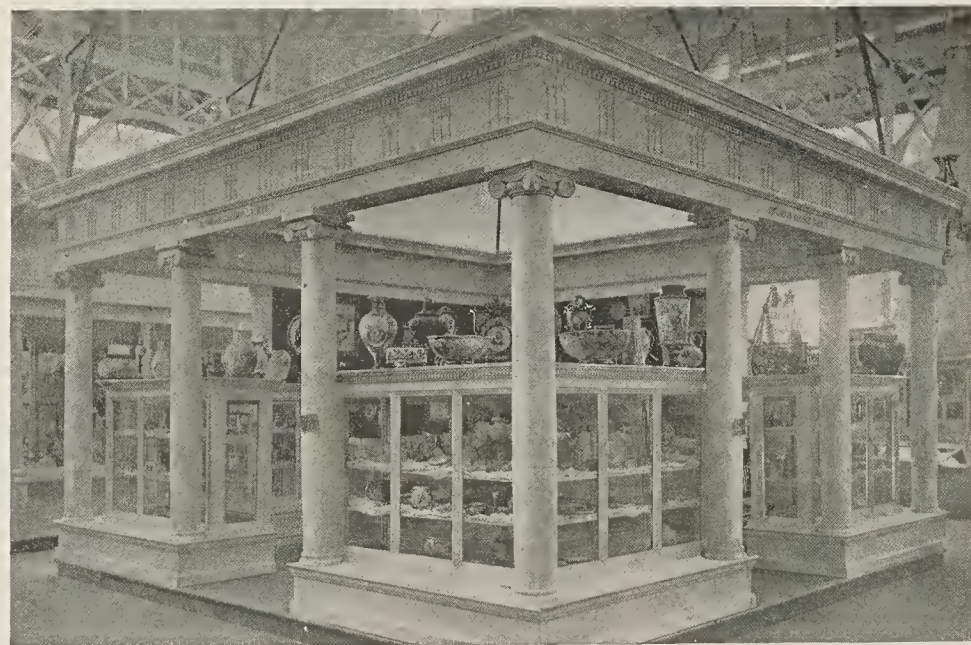
PICTURE—SUNLIGHT

manual labor in homes and schools, and by a method of teaching drawing to feeble-minded children. In Mexico's section, where are large transparencies of President and Mrs



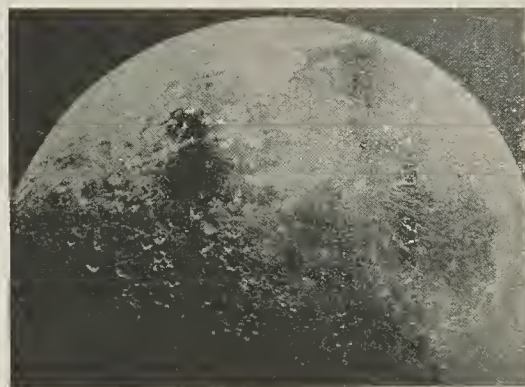
SILVERWARE

Diaz, are fully illustrated the improvements in her school system during the present régime. Here also is an assortment of musical instruments, and a museum stocked with the birds and animals native to our sister republic. Japan has a large and exhaustive collection, one fully explaining the organization of her public schools as developed within recent years, largely on the American plan, and with the aid of American teachers. All the workings of that system are here on exposition, from the kindergarten and primary grades to the high school and the Imperial university. There are also colleges of art, engineering, technology, and agriculture, with commercial schools, and schools for the blind and mute. From many of these



CHICAGO CERAMIC DISPLAY

are specimens of work and apparatus, with diagrams or models of buildings, records, reports, regulations, and statistics. From the pupils of the government schools are many samples of needle-work; pen-drawings, crayons, and colored sketches; artificial fruits and flowers; native woods and



UNIVERSITY OF NEW YORK, TINT PHOTOGRAPH OF THE MOON



THE LARGEST TELESCOPE IN THE WORLD

models in wood of buildings and bridges; decorated porcelains and other ceramic ware, and an entomological cabinet illustrating the insect life of Japan.

Considered as one comprehensive display of what has and is being accomplished the world over in the cause of education, we have in these sections by far the most complete and interesting collection that has ever been gathered together. Here may be compared the systems of countries many thousands of miles apart, the systems developed under autocratic and republican rule, denominational systems with those of the state, all grouped within a few thousand square yards of space, and yet presenting a clearer illustration of methods, appliances, and results than could be obtained from an extended tour of the world. While the entire Exposition is of itself in the nature of an educational display, the strongest factors in that display are the groups which reproduce in miniature what the world has to show us in the art of teaching—an art, indeed, it may properly be termed, for the true pedagogue, like the poet, is born, not made.



AMERICAN TRACT SOCIETY

In the central section of the northern gallery is illustrated the entire domain of photography, with the reproduction of photographs and works of art, forming a collection which goes far to prove the oft repeated statement that no branch of art or science is becoming so rapidly perfected and popularized. Here are chambers filled with the most finished specimens of albertypes, aristotypes, steel engravings, wood-cuts, photo-engravings, half-tones, and wash drawings, from the large clear photograph of a locomotive at full speed, caught by the instantaneous process, to the most delicate gems of workmanship.

Except to the specialist, the display of surveying and engineering instruments, and of meteorological, optical, and astronomical apparatus is of no great interest; but in this connection is the most striking exhibit in all the department of Liberal Arts, in the form of an equatorial telescope, sixty-five feet in length, with a lens forty inches in diameter, and weighing, apart from its foundations, nearly seventy tons. In weight it is about fifty per cent and in power twenty-five per cent greater than the Lick telescope at the Mount Hamilton observatory, the gift of a California millionaire to the cause of astronomical science,



CENTURY COMPANY



MISS DREXEL'S STAINED GLASS WINDOW



NUBIAN GIRL



POTTERY EXHIBIT, AUSTRIAN SECTION

and with this exception the largest in the world. Yet so delicate is the workmanship and so perfectly balanced the parts, that the tube and declination axis to which it is attached, weighing together 16,000 pounds, can be moved by the pressure of a forefinger. Built by the artificers of the Lick instrument for a wealthy and public-spirited citizen of Chicago, the Yerkes telescope, located near the northern end of Columbia avenue, will find a permanent home in the Geneva observatory in connection with the university of Chicago.

Beyond the galleries of photographs, engravings, and exhibits relating to the reproduction of color or form, are the collections of United States publishers, some of them so arranged as to display not only mechanical processes, but the original sketches of artists and manuscripts of authors whose works have won for them repute. Here one may read somewhat of the history of several of the great publishing houses of the United States. Thus in the pavilion of Harper and

brothers is the first book published by that firm in 1817, a translation of *Seneca's Morals*, a worn and dust-brown volume, by the side of which is a recent edition of *She Stoops to Conquer*, illustrated by Edwin A. Abbey, and the original manuscript of *Ben-Hur*.

More pictures than books are exhibited by the Century company, and of special interest is its case of Lincoln relics, including his letter accepting the nomination for the presidency, the original draft of his proclamation of 1861, calling for 75,000 troops, the proof sheets of his inaugural address, with corrections and interpolations in his own handwriting, and his message to congress in 1865, proposing compensation to slaveholders, together with portions of his correspondence with Douglas, Grant, and Jefferson Davis. In this collection is the only letter which Jefferson Davis addressed to Lincoln in his official capacity as president of the Confederate States of America. There are also casts of Lincoln's hands, and a life mask of his features, the latter taken in 1860 by a Chicago artist. In the pavilion of this company is illustrated its system of wood-engraving, and its typographic methods, the latter in a case containing proof-sheets and page-forms of the dictionary. An interesting feature is an article written by Kennan, the Siberian traveller, and mutilated by the Russian censor of the press.

The Scribners have some rare first editions and many specimens of costly and



SCHOOL FOR DEAF AND DUMB

elaborate bindings, the latter contrasting somewhat sharply with the faded yellow cover of a magazine in their collection, bearing the date of 1787—the first one published in the United States. There are many manuscripts of noted authors, some written with the pen, and others with the typewriter, and more expressive than any words that Stanley could have sent are two arrows, tipped with poison, representing an episode in his



THOMAS HOPKINS GALLAUDET



GLASS EXHIBIT, AUSTRIA

books, statistics, and diagrams, the workings of their systems, and the growth of their orders. The American Bible society has an especially interesting collection, including such rare biblical editions as the King James of 1611; a fac-simile of the first page of the first bible ever printed, the Mazarin, of 1450; a copy of the *Biblia Pauperum*, representing the style of printing from wooden blocks, and the *Hexapla*, showing side by side the Greek text and the six early versions of the scriptures. In the pavilion of this society one may examine copies of its special publications in 300 different languages.

Of the French exhibits on the gallery floor, in the department of Liberal Arts, forming as they do an integral portion and not a mere overflow of her display, mention has already

been made. The other foreign powers represented are Great Britain and her dependencies of Canada and New South Wales, Germany, Austria, Italy, Russia, Mexico, and Japan, all of them in the western section of the gallery. Italy's pavilion is in the shape of the letter T, and over its double portal, fashioned in imitation of Carrara marble, on which are painted the royal arms, are suspended the national colors. In addition to such articles as are included in her main collection, are Leghorn hats, gold-embroidered satins from Palermo, and armor from Sicily, with musical instruments from Venice, literature from Rome and Milan, and horological and other scientific instruments, from all the chief municipalities, among them a clock which as its maker claims



JOAN OF ARC

illustrates the theory of perpetual motion.

In the exhibits of other foreign powers are illustrated their works of reproductive art, their printing processes and their improvements in surgical, medical, and scientific apparatus. The English and German picture galleries have also choice collections of photographs and engravings, loaned by art societies, with contributions from private firms and publishing houses. Japan displays, in addition to her educational exhibits already described, a number of photographs representing her modern ordnance



FRENCH BRONZE



APPLE A LA DANCE

explorations of the dark continent. Houghton, Mifflin and company's pavilion is so arranged as to resemble a library, with the busts of authors appearing above their works. The Appletons' exhibit consists mainly of works of art, with a collection of reference books; by other firms juvenile literature is represented, and by a Chicago house are displayed some of the largest maps ever made, one of them printed from a single plate. In a word, every department of American literature is here represented, together with certain branches of graphic and delineative art.

Adjoining this section are exhibits which demonstrate the proselyting methods of the various religious associations. Through their publishing houses many of the churches present specimens of denominational literature, and kindred organizations explain by means of printed



ITALIAN STATUARY

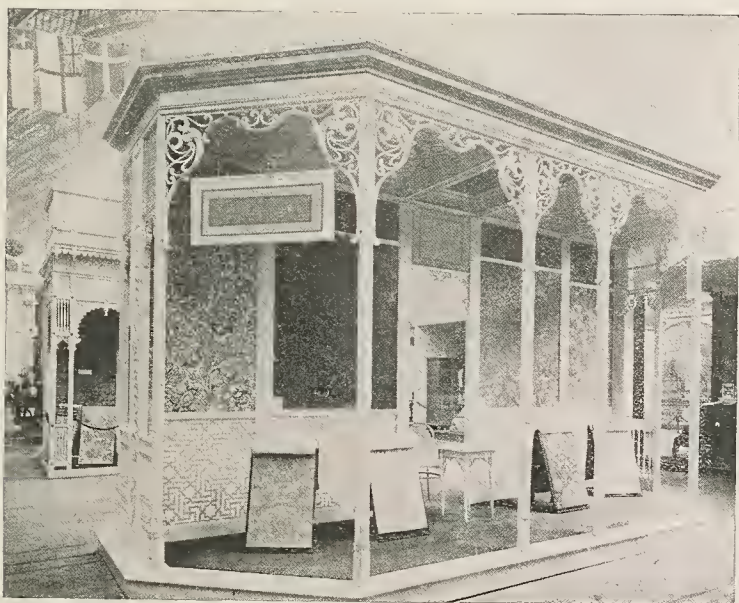
and arsenal, with charts, tables, and other illustrations of her postal system. In the New South Wales section is revealed her progress in manufactures and in the functional departments of government, the former showing remarkable development since the days, not long gone by, when, apart from a few saw and grist-mills, a small woolen factory for the production of coarse blankets and tweeds embodied the entire manufacturing industries of a colony with more than 300,000 square miles of area.



JESUS CHRIST AND PETER

WORLD'S FAIR MISCELLANY.—The Yerkes telescope, mentioned in the text, was not placed in position until several weeks after the opening of the Fair. It was not until late in December of 1892 that the contract for making this instrument was assumed by the Cleveland firm of Warner & Swasey, and it was thought that at least a year would be required for the task, the magnitude and delicacy of which it is impossible to over-estimate. The telescope was put together at the Fair, as indeed it must be; for apart from the question of transportation, to place the tube in position on its supporting columns would have required an unobstructed space equal to that of a six-story building with sixty feet of frontage.

Among the Russian exhibits in the Liberal Arts section is the Tolstoi book-case of old oak of brownish hue, with panels in the form of pictures, the design of which is burned into the wood. In one of them Tolstoi is represented at work among the peasantry on his estate; in another, busied over his manuscript and books; in a



BRITISH SECTION, WALL PAPER

third, at rest in his garden, and on a fourth is a replica of Repin's portrait of the great Russian author. The case is filled with his novels and philosophical treatises.

In the American publishers' section are some interesting manuscripts, in addition to such as are mentioned in the text and of special interest to those who love to study the chirography of prominent authors. In backhanded writing, but as plain as print, are pages from the pen of Thomas Bailey Aldrich, with the bold, dashing handwriting of Henry James, the angular, feminine handwriting of W. D. Howells, the last manuscript sheet of Frank R. Stockton's romance of *The Lady or the Tiger*, and some of the copy of Frances Hodgson Burnett's story, *Little Lord Fauntleroy*. Among other specimens are the manuscripts of Mark Twain, Bret Harte, R. H. Stoddard, and E. C. Stedman, with the letter from James Russell Lowell to Joel



Benton, in which the former cleared himself from the imputation of lukewarm patriotism, caused by his English proclivities. Finally, there is in this section a historic collection of dictionaries, including the first one published in the English language, compiled by John Bullocker, and bearing the date of 1616; the second, issued in 1623, and written by Henry Cockeram; Thomas Blount's dictionary



FRENCH SECTION, BRONZE CANDELABRA

of the edition of 1670; Samuel Johnson's of 1755, and the Imperial dictionary which James Ogilvie published in 1847, many of the features of which are reproduced in the Century dictionary.

Prominent among the Art school exhibits in the southern gallery is that of the Chicago Art institute which, though one of the youngest, ranks among the foremost in the United States. Its efficiency is largely due to the ability and zeal of the instructors, among whom are such men as Frank Millet and Lorado Taft. The character of its exhibits is indicated in my description of the institute, in the chapter containing a brief historic sketch of Chicago. The collection from the Art students' league of New York is also a creditable display, representing, as it does, modern ideas and methods,



modelled largely on the French schools. Objection has been taken to the exhibits of the Pennsylvania academy, on the ground that they reveal too strongly the influence of French impressionists. Boston has sent some excellent studies, and there are small collections from the Minneapolis and Jacksonville schools.

In the exhibits of the university of the city of New York is one of the first telegraphic messages that ever passed over the wires, forwarded by Samuel F. B. Morse on the 24th of January, 1838, and by him and his associates recorded in the university chapel. It reads as follows: "Attention. The universe my kingdom. Right wheel." The message was dictated by Professor Thomas S. Cummings, who afterward filled the chair of art, and on whom had just been conferred a general's commission. Hence the wording which, though it may have been sent in jest, was none the less prophetic. In this section are represented the several departments of the university,

including its school of pedagogy, established at the request of teachers for higher instruction in that science. To Mrs Benjamin Williamson, a member of that school, one of the advisory committee of the university, herself from the state of New Jersey, I am indebted for valuable information in this connection.

From the university of Philadelphia comes a collection of fragments of Babylonian pottery, bricks, tablets, and ornaments gathered during an expedition sent forth in 1888 under the auspices of that institution. On some of them has been deciphered the signature of Assyrian kings, and on others are strange cuneiform inscriptions, throwing light on the history and customs of the people. From the ruins of the ancient city of Nippur is an assortment covering a period of more than 3,000 years. On a

fragment of an axe is an inscription of which the following is a translation: "To Bel, his Lord Nazi Meruttash Kuri Galzu has presented this axe of bright lapis lazuli,

to hear his prayer,
to grant his supplication,
to accept his sigh,
to preserve his life,
to lengthen his days."

Other universities and colleges have also many curiosities, only a few of which can here be described. Princeton, for instance, displays a large portrait of Washington, which for more than a century was not removed from its home in Nassau hall. The frame which contains it originally held a portrait of George II, and at the battle of Princeton the picture was destroyed by a cannon-ball, but the frame was left intact. Among other relics are a commencement programme of 1760, printed in Latin, and a number of old diplomas, one of them dated 1749, when the college was located at Newark, and signed by Aaron Burr, father of the vice-president.

In addition to the catholic exhibit mentioned in the text, many of the leading protestant denominations are represented in the educational sections of the department of Liberal Arts, among them the presbyterians, episcopalians, methodist-episcopalians, and Christian brothers.

An exhibit worthy of more than a passing glance is that of the Carlisle Indian school, in the east gallery of the Liberal Arts department. In addition to specimens of penmanship, map-drawing, etc., there is a collection of uniforms, underclothing, and fancy work in glass cases, all made by the pupils, and entirely by hand, as also was a large wagon, with harness and running gear for government use.

Among the educational exhibits in the south gallery is one from the department of scientific temperance in connection with the Woman's Christian Temperance union. One of the purposes of this



ORNAMENTAL BRONZE CLOCK



LA VIGNE

organization is to provide for hygienic instruction in the public schools, with special reference to the effects of alcoholic liquors and narcotics.

For the testing of musical instruments provision was made by the department of Liberal Arts, first in an adjacent building at the north end of the peristyle, where is a recital hall with seating capacity for 500 persons, and second in the spaces allotted to exhibitors, who were invited to appoint from their own number a committee to prepare a series of programmes, both for the recital hall and the musical sections of the Manufactures building. A necessary regulation was that during the time assigned to special exhibitors, other instruments in the vicinity were to be silent.

South of Fifty-seventh street, on Stony Island avenue, and adjacent to the Fair grounds, is the International Sunday School building, which is practically devoted to an exposition of the most effective methods of religious work among children, and may be classified in the department of Liberal Arts. Here are headquarters for the Sunday School workers of the United States and Canada.



CHAPTER THE ELEVENTH

WOMAN'S DEPARTMENT

AMONG the features which distinguish the Columbian from all former international expositions are the scope and character of its Woman's department; and among the most pleasing exhibits of that department is the building which contains them. For the first time in World's Fair annals, as I have said, a special edifice has been devoted to the purposes of that department, or rather to a portion of its purposes, for, side by side, not only in the great temples of industry, but in state and foreign pavilions, are specimens of male and female workmanship. For the first time also has been designed by a woman a structure fashioned for such uses.

In the plan of this building we have the result of a national competition, but of competition only among women, the choice being made from a large number of designs, not a few of which were of unquestionable merit. The successful candidate was Sophia G. Hayden, a graduate of the architectural school of the Massachusetts institute of technology; and in the evolution of her scheme she has presented a neat and artistic solution of one of the most difficult problems of the

Fair. In this building must be contained, not only a general and retrospective display of woman's work, whether in our own or foreign lands, but space must be provided for the exhibits of charitable and reformatory organizations, for a library, an assembly-room, for parlors, committee rooms, and administration and other purposes. All this must be accomplished in a space 400 feet long by half that width, adjacent to the Midway plaisance and the Horticultural hall.

Selected for its skill of detail no less than for its grace and harmony of design, this composition is the work of a professional architect, and not, as some would have us believe, of an architectural scholar; for if Miss Hayden was before unknown to the profession, she has here given proof that she is far above amateur rank. If in her design its feminine features are somewhat pronounced, that is as it should be. As one of her brother architects observes, "It is proper that such a building should take its place with the other architectural productions in Jackson park, and it is eminently proper that the exposition of woman's work should be housed in a building in which a certain delicacy and elegance of general treatment, a smaller limit of dimension, a finer scale of detail, and a certain quality of sentiment, which might be designated in no derogatory sense as graceful timidity or gentleness, combined, however, with evident technical knowledge, at once differentiate it from its colossal neighbors, and reveal the sex of its author."

In style the building is modelled after that of the Italian renaissance,



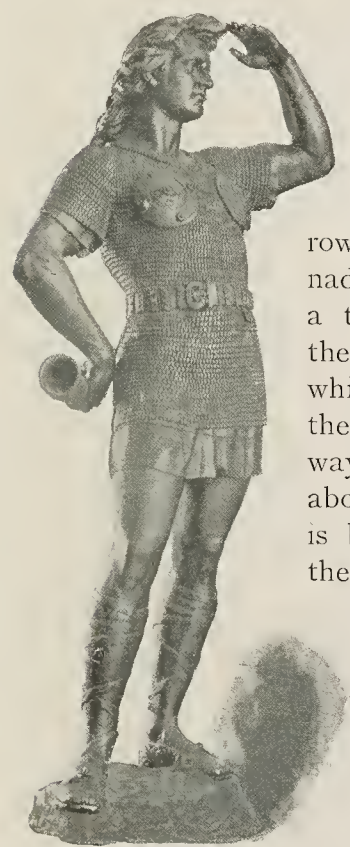
CHARITY



WOMAN'S BUILDING



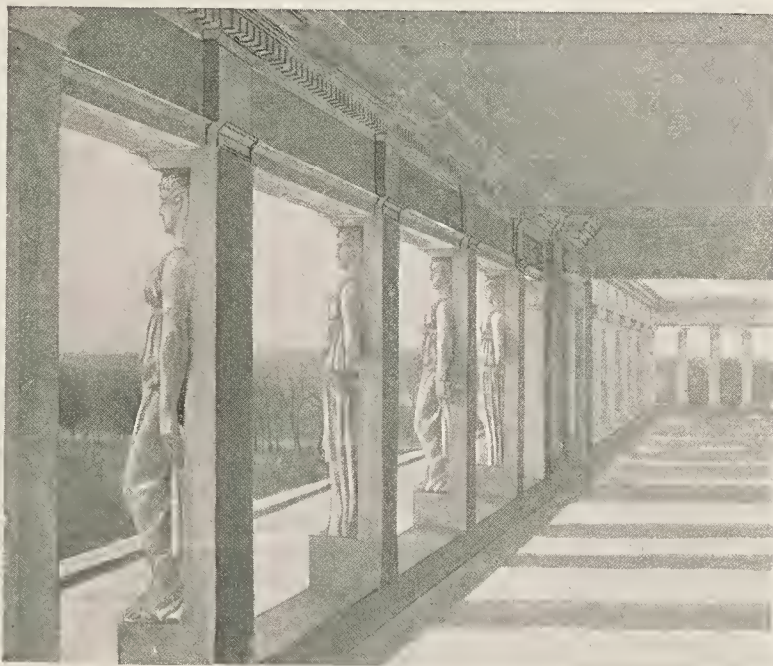
VIEW FROM BALCONY WOMAN'S BUILDING



LEIF ERICKSON

with the façades of the first story fashioned in the form of an Italian arcade, and surrounded with a portico, the roof of which serves as a balcony for the second story. The colonnade of the upper story is suggestive of the Corinthian order, and between the columns are windowed spaces, adapted to the comparatively small dimensions of the chambers within. The principal entrance is in the form of a triple arched pavilion, flanked by a surface of solid wall, with double pilasters, above it an open colonnade of the same design as those on either side, and with the pediment richly decorated in bas-relief. In front the corner pavilions are similarly treated, as also are the side entrances, but without pediments, and with rows of pilasters in place of colonnades. Over the side entrances is a third or attic story, opening at the main roof on gardens, around which is a screen of pilasters. From the central pavilion spacious stairways lead to a terrace a few feet above the water, where a landing is built on the northern arm of the lagoon.

In the interior is a central hall opening into a rotunda, with decorated skylight, unencumbered by columns, and of sufficient altitude to admit the light from rows of clear-story windows. On both floors this open space is surrounded with



UPPER PORCH



AMERICA, VINNIE REAM HOXIE

open arcades, those on the upper story serving as galleries, and resembling somewhat the corridors of an Italian courtyard. The interior plan displays the most careful economy of space in providing for suites of connected apartments, differing in size but for the most part of almost domestic proportions, and with due regard to lighting, circulation, and communication. The appearance of the building is in harmony with the conditions from which its design was evolved, suggesting rather the lyric features of the Art palace than the heroic aspect of the larger temples of industry and science, and with a grace of expres-

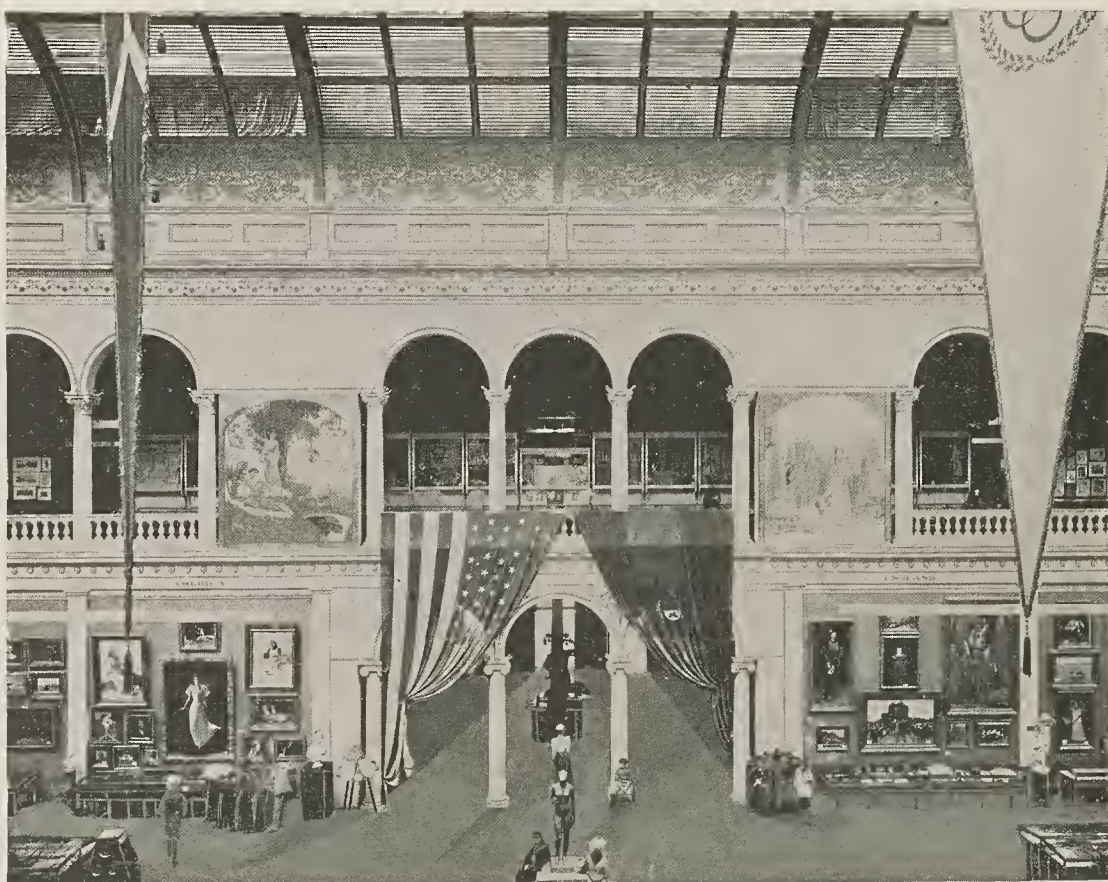
sion worthy of its uses and its artificer.

For the decorative as for the structural scheme of the building designs were invited among women qualified for such work throughout the United States, and after eager and close competition the prize was awarded to Alice Rideout, of San Francisco, by whom were modelled the compositions on the main pediment, and the symbolical groups of the roof-gardens. All the groups are more or less typical of the part that woman has played in the history of the world, of what has been, is, and will be her sphere of duty and influence. The mural paintings, with other ornamental features, as the carved wainscotings, screens, and balustrades, the tapestries and panels were also contributed by women, while from many of the states came offers of cabinet woods, marble and other materials in quantities larger than could be accepted, though to some was granted as a privilege the right of furnishing and decorating their own apartments and interior decorations.

On the roof are winged groups typical of feminine characteristics and virtues, all in choicest symbolism, one of the central figures representing the spirituality of woman, and at its feet a pelican, emblem of love and sacrifice. In the same group charity stands side by side with virtue, and sacrifice is further symbolized by a nun, placing her jewels on the altar. In another group is the genius of civilization, with the bird of wisdom at her feet; on the right a student, and on the left a woman groping in intellectual darkness but struggling after light. These and others, together with the figures on the pediment, typical of literature and art, of charity, beneficence, and home are from the hand of the San Francisco sculptress. On the frieze is a figure of youth, and on the panels of the entrance-ways are represented the occupations of women.



VINNIE REAM HOXIE



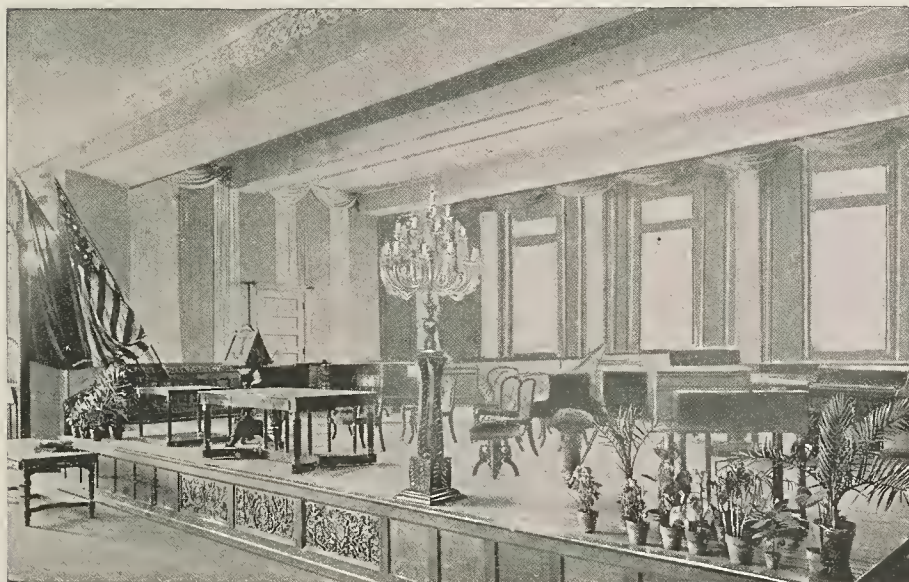
ENTRANCE



INTERIOR WOMAN'S BUILDING

To Mrs Candace Wheeler, of New York, was given the superintendence of the interior decorations, the most noteworthy of which are the paintings at either end of the rotunda, where is the court of honor. On the north tympanum, under the name of Bertha H. Palmer, primitive woman is depicted by Mrs Frederick Mac Monnies, of St Louis, the central figure representing motherhood, with women on either side sowing seed and carrying jars of water. Upon the opposite tympanum is modern woman, beneath the name of Sophia G. Hayden, typified by a group of young girls in pursuit of a figure of fame, which is disappearing in the distant blue of the heavens. A broad frieze surrounds the gallery, and between its arches are inscribed on the intervening panels the names of women whom the world has honored, from Rebecca and Ruth to the celebrities of the present day.

From the corridors which surround the court, on the



SPEAKER'S STAND, ASSEMBLY ROOM



SAPPHO, BY ADELAIDE MANAN

second floor, open the various parlors, exhibition rooms, and assembly chambers. The northern end of the main hall is decorated in gold and white, its windows of stained glass adding to the effect. The central window was furnished by Massachusetts, and symbolizes

the part which that commonwealth has played in the advancement of woman. It is flanked by two smaller ones, presented by the women of Chelsea and Boston. The walls are covered with portraits of some of the more prominent personages in the cause of education, reform, and philanthropy. A large space is occupied by a picture of Burdett-Coutts, with models of some of her institutions, and other illustrations



of her labors. The figure of Fredericka Bremer is the most prominent in the Swedish gallery. France, Norway, and the United States have also their niches of fame filled by such women as Lucretia Mott, and Harriet Beecher Stowe.

The Connecticut chamber and the woman's library open from the western corridors. In the decorations of the library is a subtle combination of colors, the ceiling, painted by Dora Wheeler Keith, daughter of Mrs Candace Wheeler, resembling the frescoes of some old Venetian palace, although the symbolic treatment is appropriate to the purpose. In the central oval, enclosed by a wreath of white lilies, literature is typified by a shapely woman, science by a man in scholastic garb, and imagination by an angel with outstretched wings. Between this oval and the Venetian border which encloses the ceiling, are loops and folds of drapery in softly blended hues representing the tints of sky and landscape, and at the four corners are medallions symbolic of history, romance, poetry, and the drama.



PAINTINGS, MAIN FLOOR

The small but tastefully furnished and decorated parlor occupied by the women of Connecticut is hung with pictures from the hands of the daughters of that state, and in addition to its other purposes serves as a reception room for the commissioners of foreign countries. Into the eastern corridor open the reception rooms occupied by the state boards, and by the women of California, Ohio, and Kentucky. Though intended for residents of those states, the parlors are open to the public, as examples of decorative art. The California department has been called the cactus room, from the fact that its coloring and decorative scheme are largely in imitation of that plant. Mrs. Frona Eunice Wait, the commissioner from California, was the originator of the idea, and carried on the actual work. A pleasing effect is produced by the grayish green of the cactus, as seen



PRIMITIVE WOMAN, DECORATION OF SOUTH TYMPANUM

in the glass windows and draperies, and the warm, rich hues of the polished redwood floor, the panelled ceiling and walls. The furniture of native woods is ornamented with similar designs, as are the carvings on the panel frames of ceiling and walls. On one side is a large mirror, and above it a panel of redwood, upon which is the shield of the state elaborately carved. The floor is partially covered by the skin of a grizzly bear from Humboldt county, and on the panels of the walls are pictures by prominent California artists, representing the flora of the state, and such scenes as the old San Francisco mission, the Cliff house, Mount Hamilton, Lake Tahoe, and Mount Shasta. Busts of native Californians are placed on pedestals of native onyx and marble;



MODERN WOMAN, DECORATION OF NORTH TYMPANUM

some of the draperies are of home-made silk, and there are vases fashioned by members of the Ceramic club of San Francisco, with other specimens representing the arts and industries of the golden state.

The largest of the suite is Cincinnati's parlor, the decoration of which was in charge of Agnes Pitman, of that city, daughter of Benjamin Pitman, who for years has been identified with its academy of design. Under the direction of her father Miss Pitman carved the first table thus decorated by a woman in Cincinnati, and here exhibited as a curiosity. Wood-carving is now a popular branch of industrial art among her women, and beautiful specimens of their handiwork are to be seen in the ceiling and in the furniture of the apartment. Around it is a frieze of floral design, shading from a pale cream color to a dark brown tint, and beneath the frieze is a border of buckeye leaves and blossoms, with tasteful mural designs. In a case near the centre of the room are specimens of Rookwood and other pottery from the women of Cincinnati. Over the door is a group named The Jury, representing in ceramic work a cluster of owls; and among the statuary may be mentioned a marble



ELIZABETH CADY STANTON

these walls of white and gold, and there is statuary by the artificer of the caryatides on the Woman's building, with tasteful specimens of ceramic work.

In the extreme southeast corner of the second floor, near the so-called organization room, is the office of the president, Mrs Potter Palmer, commonly termed the fish-net room, with seines festooned from the ceilings, a casting net forming a canopy over the president's desk, and figures representing women engaged in making eel pots, nets, baskets, and other articles connected with the fisheries. For this collection there was no place in the Fisheries or other buildings, and here through the efforts of the president and lady commissioners, and of delegates from several of the states was found for it a suitable home with adequate representation. Among the decorations is a water-color painting of New Jersey's sea-coast birds by Hardenburg with designs in fish-scales, and specimens from women taxidermists. By Mrs Williamson, secretary of the State Charities Aid association of New Jersey, and a member of the school of pedagogy in connection with the university of New York, was originated the decorative scheme of this chamber, and to her is largely due its unique and tasteful equipment.



SILVER CANDELABRA

The women of New Jersey supplied the antique colonial furniture, including tables, chairs, sofas, and a piano in use as early as 1750, some of them valuable relics of the colonial and earlier republican eras contributed by the oldest families of Salem county, New Jersey. Of such relics, in which the county is exceptionally rich, there are catalogues in the president's office prepared at the request of the Board of Lady Managers by Miss Anna Hunter Van Meter, chairman of the county committee on antiques.

Opening on the eastern corridor is the chamber set apart for the headquarters of the several state boards, with its dainty screens, embroideries, and mural decorations

figure of Ariadne, and a statuette of Evangeline, in terra cotta.

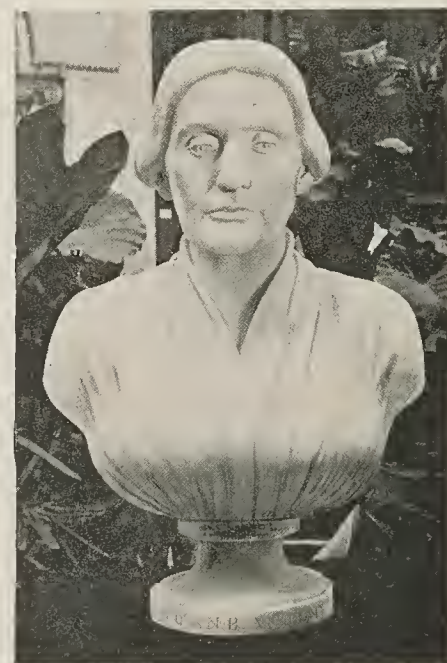
Kentucky's room is called the colonial parlor, its ceiling divided by massive beams, the supporting columns of which are entwined with sprays of wild roses. The mirrored windows and the old fashioned fireplace are in keeping with the general design, the brass andirons being loaned by a member of the family of Cassius M. Clay. By other old and prominent families was contributed most of the antique furniture, including a sofa which was the property of President Tyler, and a chair used by Elder Brewster, of Plymouth colony, more than three centuries ago. There are portraits of comely women on



DR C. B. WINSLOW



LUCRETIA MOTT



SUSAN B. ANTHONY



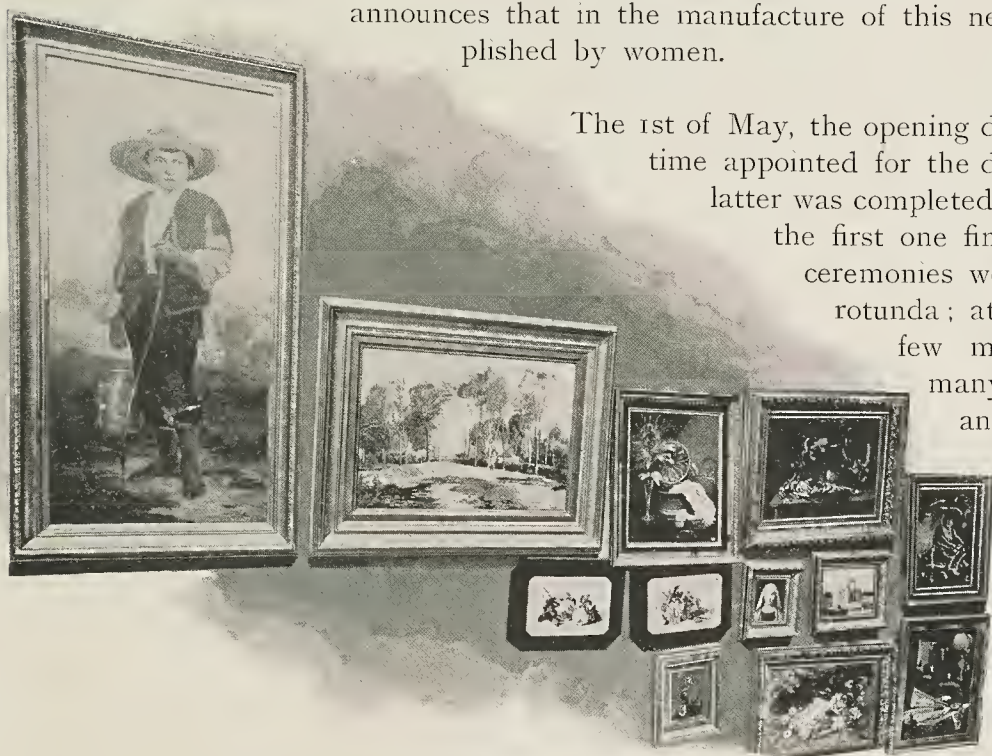
WALL OF BOARD ROOM



CORNER IN BOARD ROOM

from the hands of female artists of Kyoto, Japan. Special features are the ornamentations of the ceiling,

with paintings on silk, and the panels fashioned of bamboo frames. Diagonally opposite the president's room is the model kitchen and the audience hall, the latter also festooned with netting. A placard on the wall announces that in the manufacture of this netting ninety per cent of the work was accomplished by women.



PAINTINGS, BOARD ROOM

The 1st of May, the opening day of the Columbian Exposition, was also the time appointed for the dedication of the Woman's edifice, though the latter was completed long before that date, and as I have said was the first one finished of all the department buildings. The ceremonies were held in the court of honor, the hall of the rotunda; at two o'clock the doors were opened, and a few minutes later every chair was occupied, with many hundreds crowding the passage ways, and many thousands who could find neither seats nor standing room. On the platform, in front of which the Spanish colors, flanked by those of other powers, drooped from the gallery overhead, were the Lady Managers and their invited guests, among whom the presence of some of the most prominent women of the time, including Lady Aberdeen, the duchess of Sutherland, the countess of Craven, the duchess of Veragua, the Russian princess Schalovsky, and the Swedish baroness Thomburg-Rappe, with a goodly representation from our own and other lands, attested the world wide interest in the Woman's department.

By way of overture was rendered the grand march of Jean Ingeberg von Bronsart, followed by prayer from Miss Ida Hultin, after which came another musical number, composed by the English musician, Frances Ellicott. Then to the front of the platform stepped the daughter of Professor Wilkinson, of the University of Chicago, by whom was written and read the dedication ode, its theme a tribute to Isabella of Spain, less as a sovereign than as a woman. The dedicatory address was delivered by Mrs Potter Palmer, whose impressive description of the sphere, rights, and duties of women



BOARD ROOM



SOPHIA G. HAYDEN



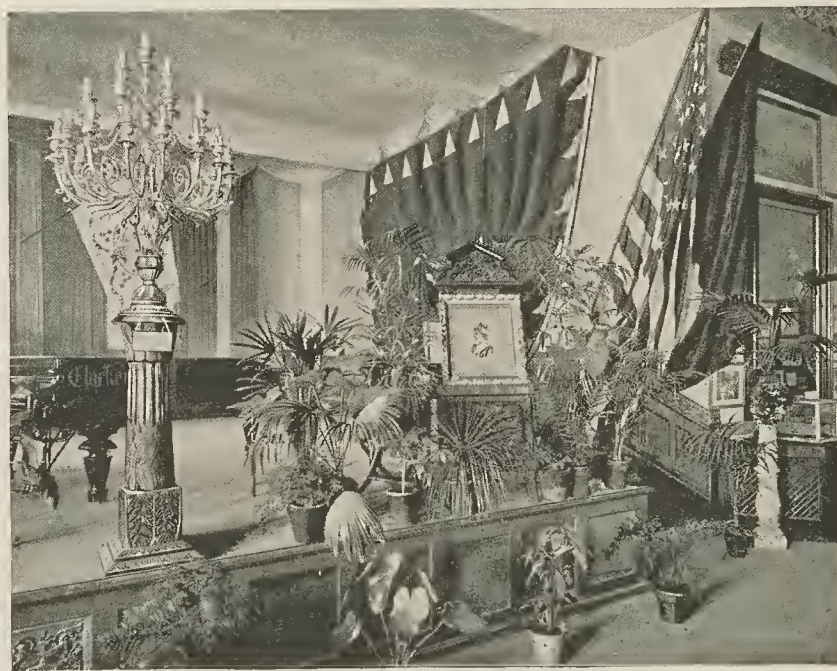
MRS POTTER PALMER'S ROOM

concluded with a graceful acknowledgment of the kindly and earnest coöperation of foreign nations. Then shorter addresses, with greetings, were offered by foreign participants, Italy being represented by Madame Marietta; Great Britain by Lady Aberdeen and the well-known philanthropist, Mrs Fenwick Bedford; Germany by a lady professor who repeated the words of her empress, and Russia by the princess Schalovsky, who begged that in thought at least her countrywomen might clasp hands with their American sisters. The ceremonies ended with the presentation to Mrs Potter Palmer, first of a silver crown, fashioned as a laurel wreath, and then of a golden nail, the gift of the women of Montana, which, when driven home into the place prepared for it, gave the finishing touch to the building. Finally the tones of the benediction proclaimed the opening of a department planned and created by woman's effort, and filled with woman's work.

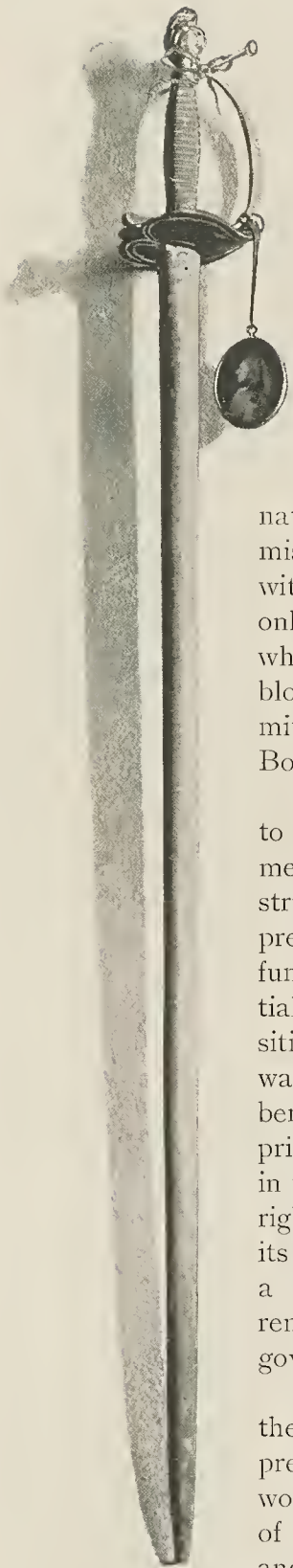
As with the Woman's building so with the exhibits by women, they form of themselves a unique and distinctive feature of the Exposition, such as never before was presented to the world, such as never before was attempted. Not as at the



ANTIQUE FURNITURE IN MRS PALMER'S ROOM



CORNER IN ASSEMBLY ROOM



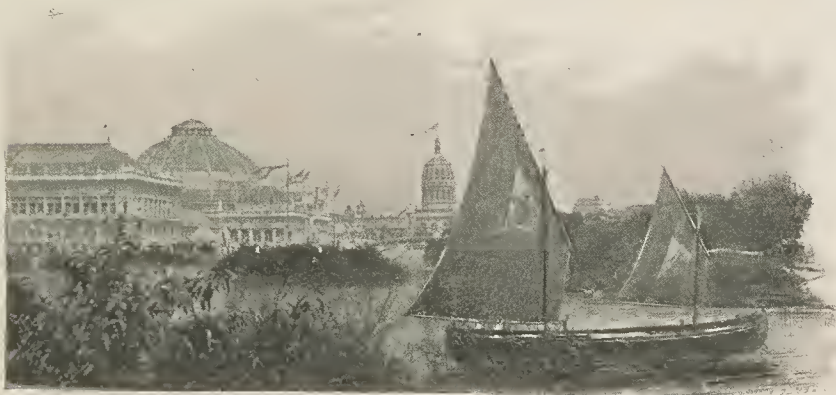
LAFAYETTE'S SWORD

international fairs held in London, in Paris, and Vienna, have these collective specimens of woman's industry and art been cast into such nooks and corners as might be spared by the several departments. For the first time they were housed in a home of their own, in one of the most beautiful homes among all these palatial groups, or in the larger buildings were arrayed in open competition with the workmanship of men. At the Philadelphia Exposition, it is true, and also at the Cotton Centenary Exposition held a few years later at New Orleans, there were comprehensive exhibits of woman's work that more than merited the attention they received; but here we have not a mere adjunct of the Fair but an integral and most interesting portion of it, one recognized by the national legislature, approved by the commission constituted by that legislature, and with the earnest and cordial support, not only of our own but of European nations, whose titled dames, even those of royal blood, did not disdain to serve on committees acting in coöperation with the Board of Lady Managers.

In the act of congress which gave to the Fair the sanction of our government, the National Commission was instructed, as we have seen, to appoint and prescribe the duties of this board, whose functions and operations have been partially described in connection with Exposition management. Among those functions was the selection of "one or more members of all committees authorized to award prizes for exhibits which may be produced in whole or in part by female labor." Thus was conceded to woman, not as a favor, but as a right, such representation in the control of affairs as enabled the board to present to us, in all its symmetry of design and perfection of detail, their Woman's department. Here was in truth a most proper, a most significant concession, and as the president of the board has well remarked, "Even more important than the discovery of Columbus was the fact that the general government has discovered woman."

To the more thoughtful class of visitors one of the most interesting exhibits contained in the Woman's building is that which represents in the form of a retrospective collection, from prehistoric eras to the age in which we live, the contributions made by women to the huge workshop of which this world so largely consists, their contributions not only to the industries of the world but to its sciences and arts. Thus it is hoped in a measure to dispel the prejudices and misconceptions, to remove the vexatious restrictions and limitations which for centuries have held enthralled the sex.

In their preliminary announcement, the managers thus outline the purpose of these exhibits: "It will be shown that women, among all the primitive peoples, were the originators of most of the industrial arts, and that it was not until these became lucrative that they were appropriated by men, and women pushed aside. While man, the protector, was engaged in fighting or the chase, woman constructed the rude semblance of a



ANTIQUE FURNITURE



A PIANO OF 1750

home. She dressed and cooked the game, and later ground the grain between the stones, and prepared it for bread. She cured and dressed the skins of animals, and fashioned them awkwardly into garments. Impelled by the necessity for its use, she invented the needle, and twisted the fibres of plants into thread. She invented the shuttle, and used it in weaving textile fabrics, in which were often mingled feathers, wool, and down, which contributed to the beauty and warmth of the fabric. She was the first potter, and molded clay into jars and other utensils for domestic purposes,



BARONESS BURDETT-COUTTS



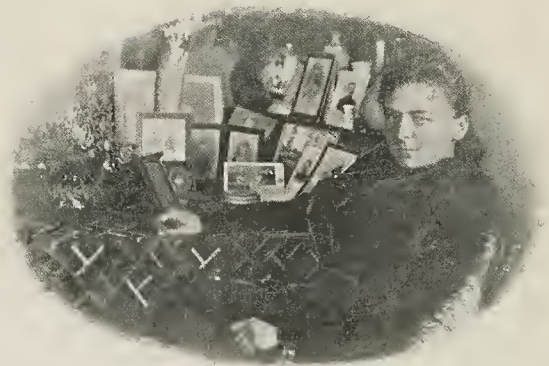
COUNTESS DI BRAZZA



DUCHESS DE VERAGUA



MRS JOHN J BAGLEY



PRINCESS SHAHOVSKY



LADY ABERDEEN



MRS FRANCIS B CLARK



MRS BENJAMIN WILLIAMSON



MRS FRENCH SHELTON



MME DUPUY DE LORNE



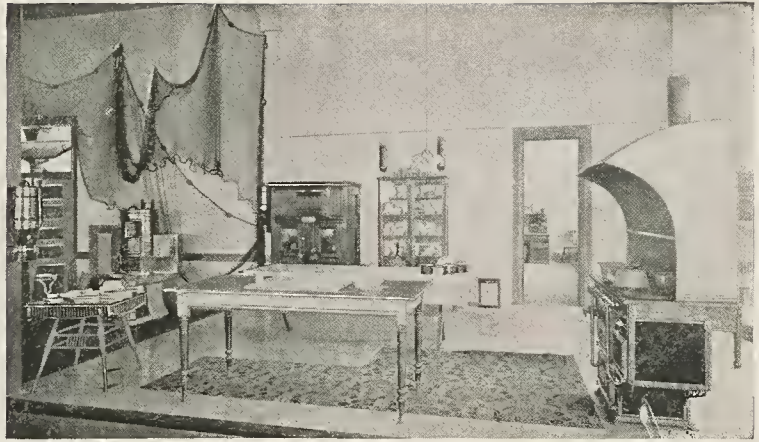
MRS RALPH TRAUTMANN



MRS PRESIDENT DIAZ

drying them in the sun. She originated basket-making, and invented such an infinite variety of beautiful forms and decorations as put to shame modern products. She learned to ornament these articles of primitive construction by weaving in feathers of birds, by a very skilful embroidery of porcupine quills and vegetable fibres, and by the use of vegetable dyes. Especial attention will be called to these early inventions of women by means of an ethnological display to be made in the Woman's building, which will supplement the race exhibit to be made in the department of Ethnology."

To present, in some branches of manufacture, an entirely distinct collection of woman's work, would have been an impossible task, for who shall tell, for instance,



MODEL KITCHEN



TEMPERANCE PUBLISHING ASSOCIATION

in a piece of cloth, what part of the weft was woven by men and what by women, who may have worked side by side in fashioning the completed fabric? But, as I have said, in the Woman's department, the decorations and exhibits of whatever kind, are the work of woman's hands. As originally planned the building was to be used only for administrative purposes and assembly-rooms; but although feminine industries were largely represented in all the departments, as the work of organization progressed it became evident that many would be entirely excluded, were not additional space provided. Thus it was that the Woman's building was so largely devoted to exposition purposes.

As to the distribution of woman's work in other departments of the Exposition, Mrs Palmer remarks: "In the department of charities and corrections, for instance, and also hospitals, many of the most important exhibits are from women, and we have gladly relinquished them in our building in order that they might be well represented in the Liberal Arts department.



COURT OF HONOR, WOMAN'S BUILDING



ITALIAN LACES



QUEEN OF ITALY'S POINT D'ARGENTAN

In the Fine Arts building also many of the best pictures by women are shown, as the space we could give them was extremely limited. In the department of Transportation twelve per cent of the exhibits are by women. In Horticulture forty-six per cent, and in Fisheries twenty-six per cent. We have also a fine showing in the department of Ethnology, and, it is useless to add, in the department of Manufactures, where woman's work would naturally appear to great advantage."



ITALIAN LACES

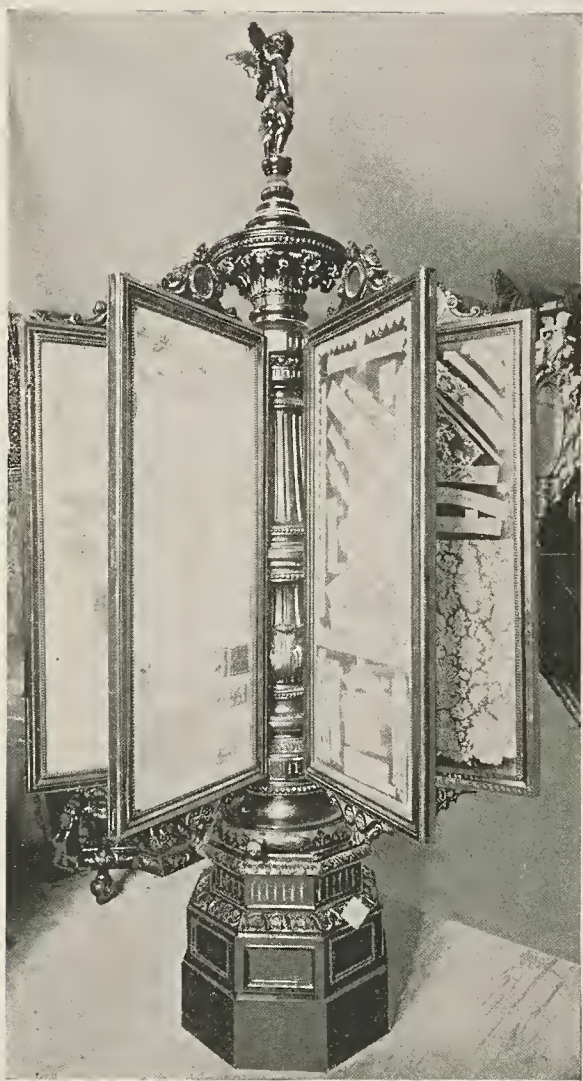
Passing through the main eastern portal, the visitor enters a large vestibule decorated by English artists. Philanthropy is represented in the person of Florence Nightingale ministering to sick and wounded patients in her hospital. On either side of her figure are symbolic paintings, and on the opposite wall is a central group typical of artistic needle-work.

Turning to the left we enter the suite of rooms, containing the ethnological groups and those which demonstrate the practical ingenuity of woman. The collection from the Smithsonian institution is at the entrance to this section, and is mainly illustrative of woman's work among the native races of the western continents. In a gallery of portraits are shown the various types of Indian women in North and South America. There are cases filled with costumes, needle-work, utensils, bodkins, tools, baskets, pottery, netting, and the like. There are primitive shuttles, distaffs, and looms, made of reeds and rough wood, samples of skins dressed by Eskimo and other Indians, tapa cloth from Polynesia, matting from Africa, and blankets from the Navajos of the southwest.

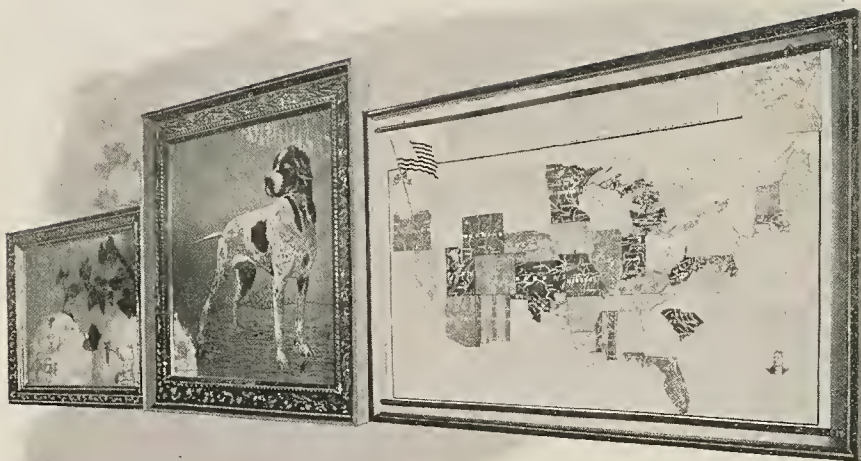
In one of the landings on the southwestern staircase, the work of manufacture is shown in actual operation, in a booth fashioned of the products of a loom manipulated by a Navajo woman of Colorado.



MRS CANDACE WHEELER



ITALIAN LACES

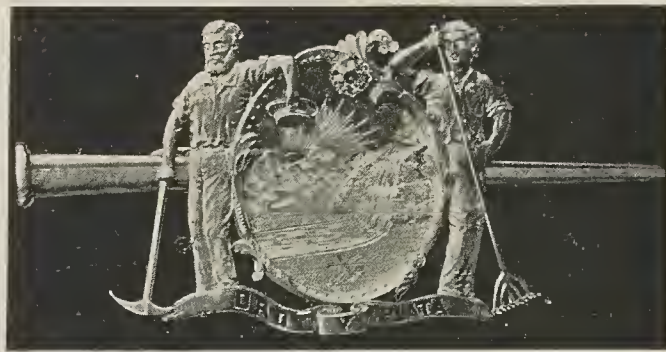


CENTENNIAL EXPOSITION SOUVENIR

In the exhibit of the Smithsonian institute one of the most remarkable evidences of skill among semi-savage women is also from Navajo looms, and some of the basket-work made by North American Indians is so closely woven that it will hold water. Montana and Utah have special displays, Skull valley being the locality represented in the latter territory. Among the Smithsonian specimens illustrative of woman's work, is the exhibit of laces and kindred fabrics including a thousand samples, so arranged as to represent different periods of manufacture. Those selected prior to 1550 are merely knotted net, darned, and cut work. Then come point, bobbin, Venetian, Milanese, Genoese, and Flemish laces, with those peculiar to France and England, all the schools being represented in this assortment, which was loaned by Thomas Wilson, of the national museum.

By Mrs French-Sheldon, who traveled through eastern Africa, at the head of a large caravan, unattended by any of her sex, were placed in the ethnological section many curios collected during her expedition. Among them are spears, great and small; knives finely tempered in charcoal fires; beads of brass, copper, and iron, and various utensils made of gourds, traced with heated wires in Persian and Arabesque designs. The last are copied mainly from articles obtained at the bazaars held by the Arabs of the coast. There are also curios, presented to Mrs French-Sheldon by Frederick Taylor, of New York, procured while traveling in Madagascar; including colored silks, the white caps of the Hova soldiery, and other samples from the more intelligent portion of the population. From the warlike Sakalavas, a tribe of fierce and swarthy savages living apart from settled communities, were procured two of their hideous war-masks, made of perforated terra cotta, fastened with fibres of the palm, and to which are appended long beards of goats' hair.

From the ethnological section we enter an apartment which contains the inventions and patents of women; and here is sufficient evidence that aside from purely feminine industries women are applying themselves to pursuits of practical utility. Among their inventions are weaving and washing machines, refrigerators, dusters, flour sifters, egg beaters, meat boilers, beef mangers, frying pans, trunks, and apparatus for detaching runaway horses from vehicles, with patent surgical bandages, hot-water appliances and sanitary dinner pails and filters; all these in addition to a choice display of needle-work, ceramic ware, paintings and statuary, engravings, etchings, and photographs. Near the entrance to the educational section, north of the vestibule, is a large picture representing the wreck of a ship and the rescue of her crew, while a portion of the wall beyond is covered with charts, testimonials, patent papers, and other evidences of the general adoption of the signal system invented by Mrs Martha J. Coston, more than thirty years ago. This is the only system of night signals recognized by the United States government and the British board of trade, adopted also in part by France, Italy, Denmark, Holland, and Brazil. There is probably no prominent steamship line, or life-saving station in the world which is not familiar with this patented invention of a woman. In the exhibits of the educational department are illustrated the methods of woman's training, physically, industrially, and intellectually. New York sends an array of architectural drawings, and designs for carpets, book covers, wall-paper, oil-cloth and printed textiles, the bulk of the contributions coming from the school of Applied Designs for Women, the school of Industrial Art, and



MONTANA NAIL

the Pratt institute. Physical culture is represented by the Bryn Mawr school, of Baltimore, and there are many individual proofs of efficiency in the field of professional work. From Turkey comes a small collection of drawings, needle-work, and other evidences of female industry, from the American school for girls, at Scutari. The medical profession is represented by the Pennsylvania college for women, at Philadelphia, and nursing, as a profession for women, by the New York and Brooklyn training schools, and the Philadelphia hospital for nurses.

Adjoining the educational section is one in which are traced the processes in several branches of female industry, the exhibits being of a somewhat miscellaneous character. At the entrance is typified, in the form of a large Pennsylvania sheep, the shearing industry, in which thousands of women are employed. A case filled with raw silks and silken fabrics represents the work of Utah women, and their many sisters, throughout the states, engaged in the raising of cocoons. Elsewhere are portable kilns, patented by women, with various articles of pottery; and from the women of Iceland is a display of hand spun and knit woolen goods, hosiery, and gloves.

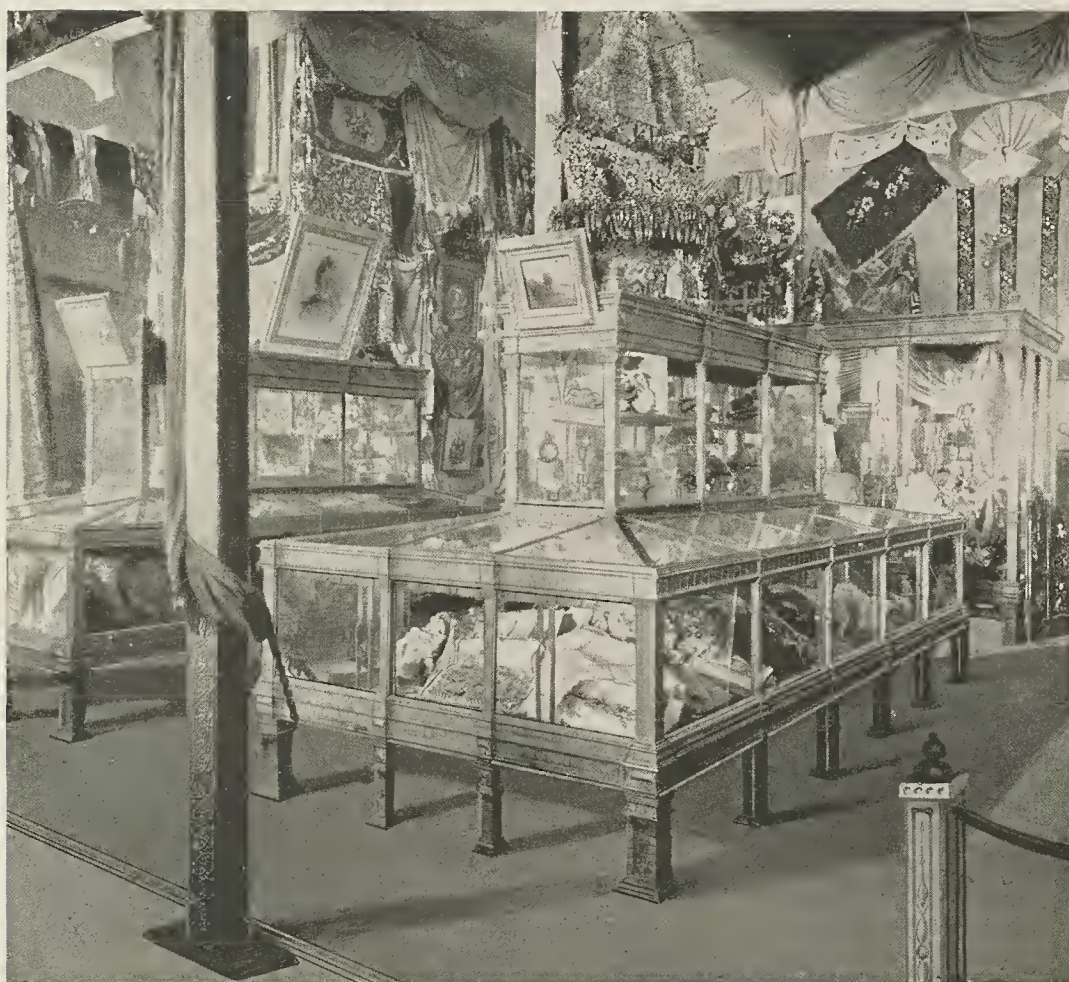
Entering the rotunda, or court of honor, the visitor sees on one side a bust sculptured by Sara Bernhardt, and on the other the reproduced fragment of an old Italian statue, while on the walls are pictures representing the best work of women in all the national schools. The body of the hall is filled with long lines of cases containing choice specimens of needle-work and ivory painting. Around the central fountain, with its border of aquatic plants, is a cluster of statuary, consisting of figures of Psyche and Maud Müller, and busts of C. B. Winslow, Susan B. Anthony, and Elizabeth Cady Stanton, with a group allegorical of the west by Vinnie Ream Hoxie, of New York, one of the pioneers among female sculptors. Near the western vestibule is also her statue of America, and this section is further beautified by several mural paintings of French artists, and by a bronze statue of



INVENTIONS AND PATENTS



EDUCATIONAL DEPARTMENT



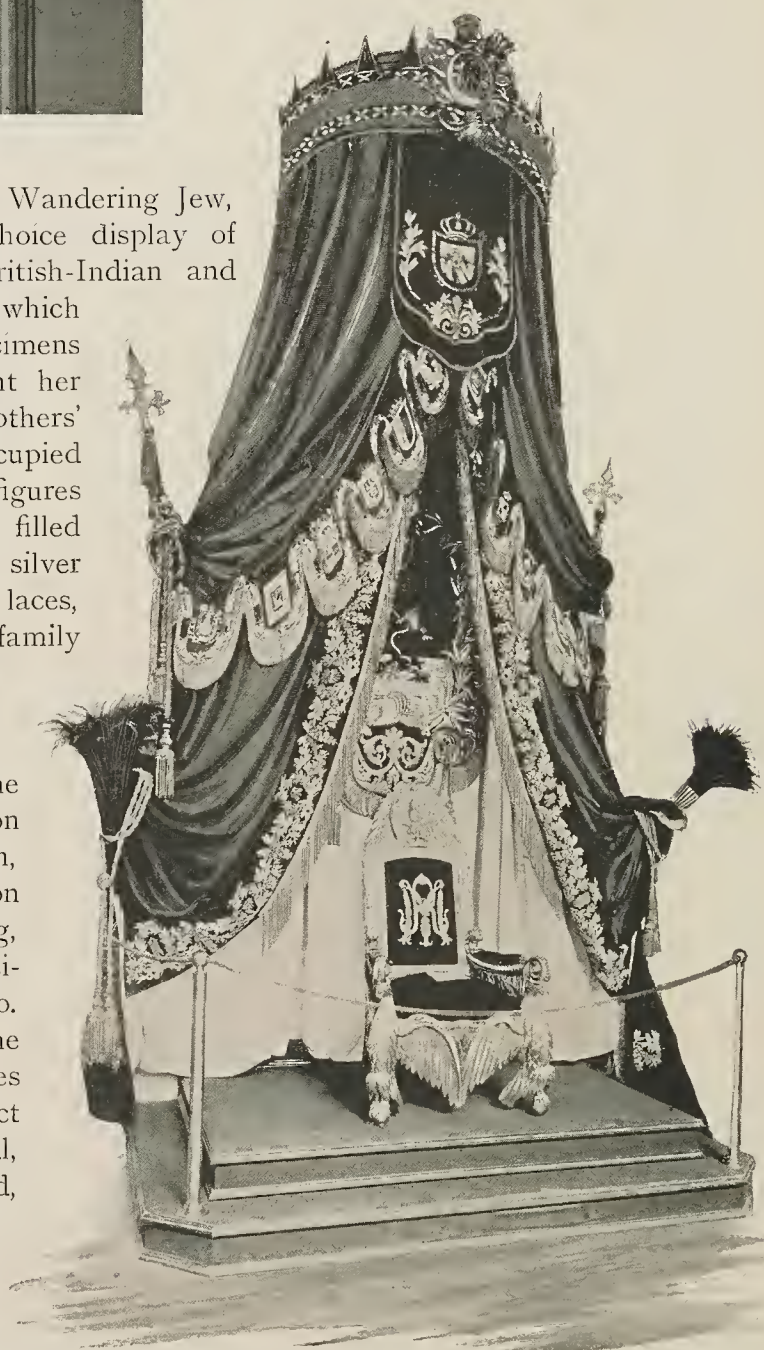
MEXICAN SECTION, WOMAN'S BUILDING

both showing quaint and tender touches of child life; and *The Wandering Jew*, a powerful work by a German painter. Below is arranged a choice display of decorated fans, miniatures, and other articles of vertu. British-Indian and Bohemian fabrics may also be examined in a series of cases which cover a large portion of the ground floor, and many ingenious specimens of needle-work from the Bohemian Industrial museum, represent her earlier periods of national industry, under the title of *Our Mothers' Work*. A large area in the northern portion of the hall is occupied by the Danish exhibits, the location of which is indicated by figures of peasant women, attired in national costume. The cases are filled with paintings, fine needle-work, laces, specimens of ancient silver work, and antique spinning-wheels. In one of them are the laces, embroideries, table-covers and pictures contributed by the royal family of Denmark, with roses painted by the queen, fruit by the princess Waldemar, and from the princess royal a collection of laces and handkerchiefs. Italian, Austrian, English, United States and Mexican works occupy sections of the western walls of the rotunda, one of the largest and strongest paintings in this portion of the court being that which represents, in the British division, *Eurydice sinking into Hades*. The industrial arts find expression in the cases ranged along the hall, toward the south, containing, among other samples, the laces of Russia and Austria, and specimens of elaborate needle-work from the nunneries of Mexico. Among other objects of interest is the table presented by the women of New Mexico, and designed to show the mineral resources and filigree silver industry of Santa Fé and the mining district adjacent. On its face is a gold medallion of the territorial seal, with historic buildings reproduced in silver repoussé. The gold, silver, and copper, the turquoises, garnets, agates, and petrified woods of which the table is largely constructed are all of local production.

The south wing of the building and the western half of the north wing are substantially occupied by exhibits from

Leif Erikson, by Anne Whitney, the Boston sculptress. On one of the walls of the northern corridor is a shield of polished copper, and across its face a silver bow, with string of golden wire, and in raised silver letters the inscription, *Silver Bow county, Montana*. The shield is surrounded by a border of gold, silver, and copper, with designs of the state flower, the bitter root. Silver nails fasten the bow to the shield, which is adorned with Montana rubies and sapphires, and with medallions of copper and silver in low relief, representing various mining scenes.

Spain, France, and Germany cover the eastern walls with paintings by prominent female artists, among which may be mentioned the two French canvases named *The Bath*, and *Jean and Jacques*,



PRESIDENTIAL CHAIR, MEXICO



MEXICAN APRON

foreign countries, Great Britain, with her dependencies, filling the largest area. The embroideries, tapestries, and other articles contributed by the royal school of art needlework comprise many beautiful specimens of feminine skill, not a few of which are from the princess of Wales and her daughters. From the future queen-consort comes a chair, with carved frame of stained walnut, and seat of ornate leather work; the princess Louise sends a delicate sofa cushion of white silk, embroidered with primroses, and Maud and Victoria, piano-stools ornamented with their work in the form of dahlias, while from Queen Victoria



MEXICAN LACE

is a rich tapestry, whose central figure represents Pomona, wrought in colors which blend like those of ripe fruit. Among the screens noticeable for their beauty is a Louis Quinze, panelled with satin, and decorated with blue bows and sprays of flowers. In the piano-covers, bed-spreads, cushions, fans, vellum book-bindings, laces, wood-carvings, and ceramic wares are illustrated the many industrial pursuits of English women, and especially such as are fostered by the societies which have their headquarters at the Kensington museum.

But the most striking exhibits in the British section are those that pertain to education. Here Girton and Newnham colleges, Cambridge, Lady Margaret and Somerville halls, Oxford, the Cheltenham Ladies' college, Queen's college, Belfast, Alexandria college, Dublin, Queen Margaret's college, Glasgow; all these and others in Great Britain for the higher education of women, are represented in a collection of photographs and reports. There is also a small gallery of the portraits of children, and appended to this collection of comely, fresh looking faces is the motto, *Non angli sed angeli*. The department of philanthropy is in charge of the baroness Burdett-Coutts, and illustrating certain phases of charitable work in England are models of a children's holiday home, a crèche connected with the Ragged School union, and a cabmen's shelter decorated by the London Flower Girls' mission.

The women of Ireland, Scotland, and Wales have organized separate exhibits. Very homelike seem the knitted underwear and bed-spreads made by the people of Wales, and quaint are the living and wax figures of Welsh spinners



MEXICAN FILIGREE WORK



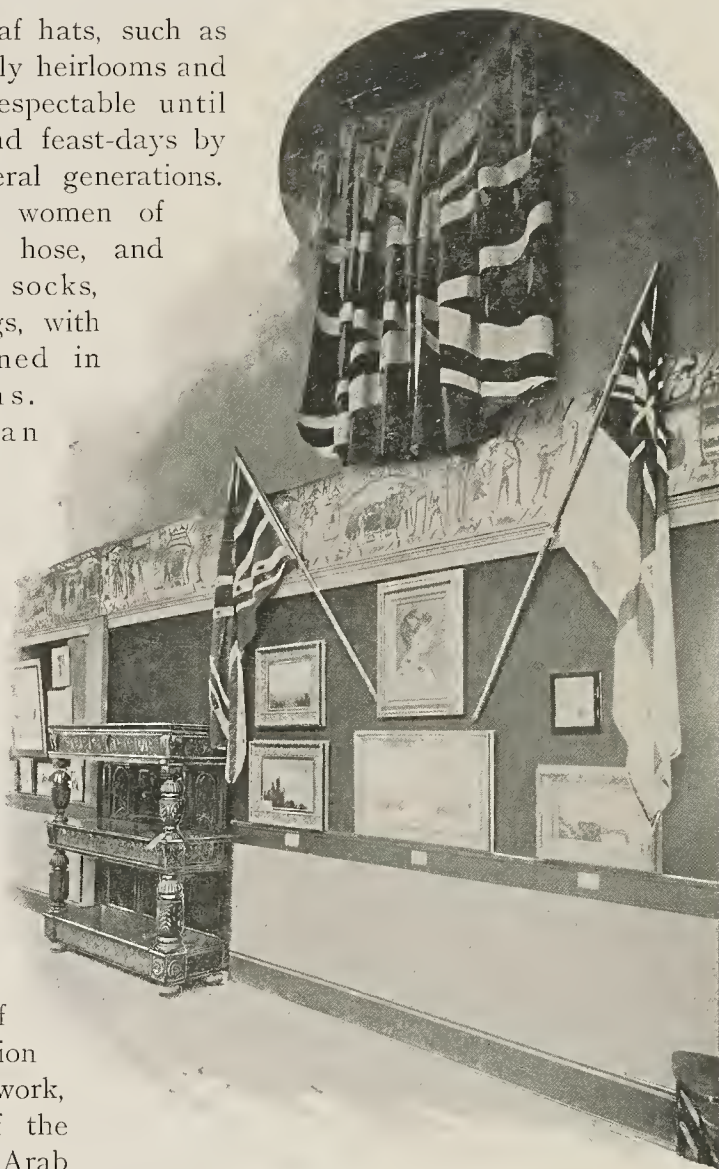
MEXICAN WAX FIGURES



BRITISH NEEDLE-WORK

to the historic interest of the Scottish exhibit are antique laces, curtains, embroideries, draperies and screens, characteristic of various periods in the country's history. The oldest is a portion of a hanging in green velvet, embroidered with raised needle-work, a style popular in Scotland during the later dynasty of the Stuarts. Another interesting specimen is in the form of an Arab frieze, fashioned of pieces of cloth, leather, and tinsel, sewed

in their tall sugar-loaf hats, such as are treasured as family heirlooms and barely considered respectable until worn on Sundays and feast-days by the women of several generations. From Scotland the women of Argyle send tartan hose, and those of Aberdeen socks, gloves, and stockings, with embroideries designed in Turkish patterns. Among antiquarian treasures is the embroidered coverlet from the bed of Patrick, earl of Kinghorn, said to have been worked in 1606, and loaned by the countess of Strathmore, with a portière from Lady Aberdeen, made in 1740 by the countess Anne. From another contributor



QUEEN OF ENGLAND'S EXHIBIT

upon a background of plush, the figures, thus formed in relief, representing Arab chieftains and Bedouins of the desert—men, women, and children. This also is the handiwork of a woman who learned the secret of the art while travelling in Egypt.

In conjunction with the Industries association, Ireland has a neat exhibit of laces and embroidered church vestments. Among the latter are a robe ornamented with an old Celtic cross, worked by the nuns of Kenmare, and an elaborate floral design, in many colored silks, contributed by the royal school of Art Embroidery. New South Wales and Canada have also unique displays of woman's work, the former sending us, among other articles, a cow and calf modelled in wax, and covered with natural hair.

The Russian exhibits, adjoining those of Great Britain on the east, are under the immediate direction of the grand duchess Elizabeth, of Moscow, sister-in-law to the czar. They include a large display of laces and embroideries, with several collections designed to show the progress of Russian women in the practice of medicine and surgery, especially in relation to hospital service. The wives of governor generals throughout the entire empire aided in furnishing a complete representation of woman's work in Russia. Thus from the valley of the Amoor and the northern arm of the Volga, and from all the vast stretch of territory between Russian Poland and eastern Siberia, came specimens of female handicraft. Of excellent quality are the samples from the province of Kazan, including rich embroideries in silk, silver, and gold, on a groundwork of satin, linen, and leather. The native dress of peasant girls, and the court costumes characteristic of imperial dynasties,



QUEEN OF ENGLAND'S WORK



BRITISH NEEDLE-WORK

are illustrated by models suitably attired. One of the dresses is said to have been worn by a member of the court during the reign of Ivan the Terrible, three centuries ago. There is also reproduced a convent door in Moscow, with its multitude of gilded figures, the groundwork of turquoise, and in the centre a curtain of olive-colored velvet on which are designs in antique lace.

In one of the cases in this vicinity is represented a work of philanthropy undertaken by English women at the time of the Russo-Turkish war of 1877. During that war many Turkish women flocked into Constantinople, and hearing of their destitute condition, Lady Layard, wife of the British ambassador, and Baroness Burdett-Coutts established a fund for their relief. As the sufferers were experts in oriental needle-work, possessed of many secrets in construction and design that were a revelation to their patrons, they were encouraged in these industries. The various colors which they were accustomed to weave into their fabrics, and the simple designs with which they adorned them, were modified and elaborated by the methods of modern schools. Hence, while the exhibit known as that of the Turkish Compassion Fund contains many samples of embroideries, cushions, silks, and shawls, it has also specimens of elaborate ball-dresses, draperies, scarfs, and other articles of personal and domestic use and ornament. The proceeds from the sale of goods go toward the support of those employed, and for the care of the sick, supplying the needs of more than 2,000 Mohammedan women.

In the eastern portion of the north wing are the exhibits of the United States, or as announced over the entrance, an exposition of the applied arts of America. Here nearly every state in the republic displays its most artistic needle-work, its costumes, ceramic wares, mosaics, and other specimens of industry, largely contributed

by societies of national repute. The associated artists of New York have a choice exhibit of embroideries and tapestries, and among the costumes shown in this section is the dress worn by the late Mrs Benjamin Harrison at the inauguration of her husband as president of the United States.

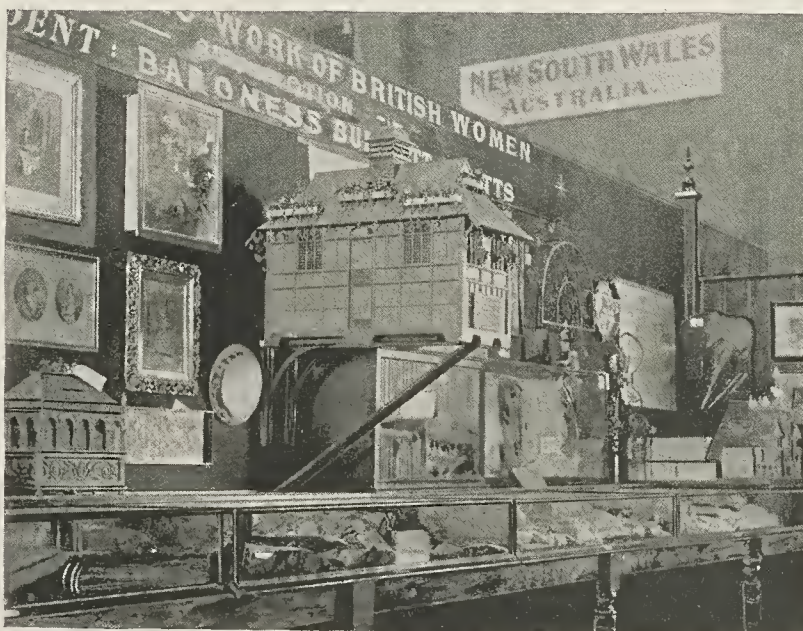
West of the court of honor, adjoining the vestibule, are the telephone office, information bureau, and the exhibits which illustrate the scientific education and attainments of women. Among them are many collections of minerals, fossils, and botanical specimens, gathered by women from all parts of the world. Woman's work in the surveyor-general's office finds expression in a series of maps and drawings, and Massachusetts, through the Prang Normal classes and various societies for the encouragement of home studies, illustrates certain phases in the scientific education of women. Here also is a case containing scientific works, including the *Notes on the Satellites*



WALES EXHIBIT

of Saturn by Maria Mitchell, late professor of astronomy at Vassar college.

Opposite the Russian section is a reproduction in miniature of the Sioux City corn palace, which may also be seen in other forms elsewhere in the Exposition. The one in the Woman's building was designed by Mrs William I. Buchanan, wife of the chief of the Agricultural department, and the model is the handiwork of the ladies of Sioux City. The paintings of flowers and fruits which appear to decorate the interior, are in reality composed of kernels of corn and seeds of different colors, and the frescos of the ceiling, of pampas



NEW SOUTH WALES



WORK BY THE COUNTESS OF ABERDEEN

them is a St Augustine beauty in full skirt and lace mantilla; then a colonial maiden, a miss of New Amsterdam, a New England dame, a Puritan and a quakeress, a New York woman elegantly attired in silks and furs, a matron of revolutionary times, a balloon-like figure of the era of the civil war, and the fashionable dames and damsels of the present day.



IRELAND

are heirlooms descended through many generations, some of them articles the secret of whose manufacture is known only to the royal household, and others samples of varieties which the queen is introducing among the women of Italy, reviving an industrial art that was well nigh lost. The pavilion is furnished in the style of the fifteenth century, the furniture and the iron gate at the entrance, of delicate lace-like workmanship, being made in Venice. Within the court is a lay figure,

grass and millet seeds, while in the construction of the large picture known as *The Water Carrier*, the native grasses and grains are used.

In the main hall-way of the northern wing, opposite the exhibit of the Turkish Compassion Fund, is a case containing quaint, doll-like dummies attired in female costumes. This is a loan collection by New York women, the figures portraying women representative of American history, from the early Spanish to the present times. Among

In the south wing, the Spanish pavilion occupies the post of honor, in the centre of other foreign exhibits, the collection illustrating many of the activities of women in the line of art industry, whether residents of Spain or Spanish-American countries. The display of woman's handicraft embraces specimens of needle-work, knitting, crochet-work, lace-making by hand and loom, plain and colored embroideries, tapestry, embossing, fine and coarse domestic cloths, and other textile fabrics peculiar to each section of the country, so arranged as to form a historic collection, this idea forming the motif of the design. The work of women is further illustrated by articles suggestive of their labors in the government tobacco factories, and in the culture of silk. Many of the choicest samples are from industrial institutions under government auspices, and from those established for the education of the deaf and dumb.

Separated from the Spanish section by the Japanese division is the pavilion of Italy, the royal laces of the house of Savoy, never before displayed in foreign lands, forming the nucleus of the exhibits. For their safe keeping and return a bond was required from the government of the United States, and then by their owner, Queen Marguerite, they were placed in charge of a detachment of royal marines, with the countess di Brazza specially instructed to see them safely housed within the pavilion; for these



AUSTRALIA

engaged in making lace, with choice specimens of bridal veils, of Burano, Genoese point, and Sicilian and Venetian laces. Of all the queen's treasures, there are none more highly prized than the bed-spread under which Victor Emauel was born. Finally the collection serves as samples of the work which is now being done by the poorer classes of the kingdom, and many of the pieces on exhibition are from those who receive instruction at the schools of Burano, of which the queen is president. Much valuable information was collected by the Italian commission as to the ancient history of textile arts, and especially of lace-making, all of which is conveyed in the form of books and photographs.

Japan presents in her two chambers a dainty picture of the industrial and domestic occupations of her women, one representing the boudoir of a lady of high rank, and the other a library. In the former are all the articles of toilet used by the wives of the daimios, or feudal lords of olden times, specially prepared for the purpose. In the library is a collection of miscellaneous articles, including stringed instruments, mats, screens, banners, a case of books, a writing table, and other appropriate furnishings. There are also oil-paintings, pictures in relief, carvings in ivory, cocoons, raw silk, embroideries, crinkled textures and crapes, hand-woven tapestries, laces, cloisssonne, enamel-work, china-ware, lacquer work and artificial flowers. The empress, the empress-dowager, and the princess Mori all took an active part in the organization of the Japanese exhibit. By the first were contributed choice specimens of raw silk; by the second, fabrics woven in her own palace, while the princess, as president of the Japanese commission, also gave her cordial support.

To the French section in all its completeness, Parisian milliners and glove makers contributed their daintiest

conceptions. D'Alencon, Chantilly and French point-laces fill several cases, and there are complete trousseaus for matrons, young girls, and infants, with handkerchiefs, fans and parasols, such as only the French can make. For the display of several elegant costumes by a Parisian house is provided a model drawing-room, in which a tea-party is in progress. The walls are covered with tapestry, and at the table of antique design presides the hostess, attired in a gown of brocaded satin, trimmed with lace. The evolution of the art of dress is represented in a large glass case filled with dolls, or other miniature reproductions of famous women: St Clotilde, wife of Clovis; the royal dames of Francis I and Henry IV; the Medici, Marie Antoinette, and many other historic characters are here represented with singular fidelity, the details of dress being copied from portraits of the originals.



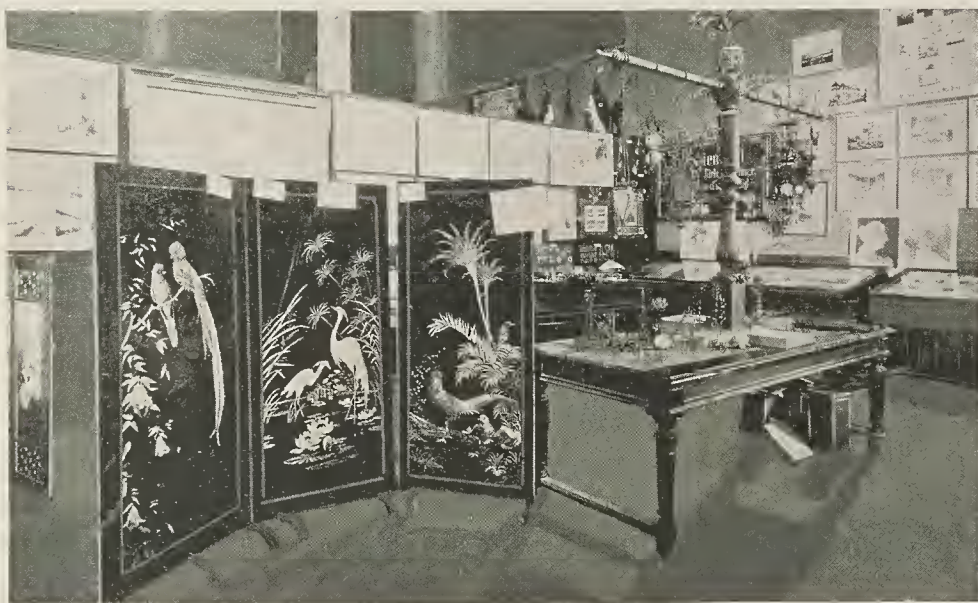
JAPAN



CEYLON



COLORADO INDIAN ALCOVE



GERMANY

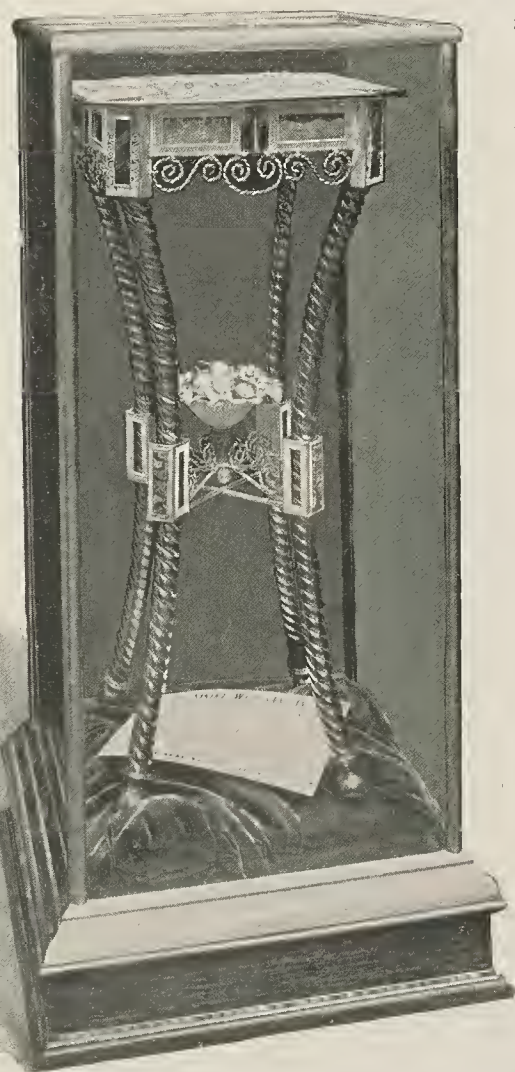
Between the French and Spanish sections are those of Mexico, Norway, Sweden, Siam, and the cape of Good Hope. The rich specimens of needle-work, in gold and silver, from the women of Siam, with many other samples, appear almost side by side with the industrial products of the peasantry and societies of Sweden. In the shape of a church window is a beautiful specimen of stained glass, the Swedish saint, Bridget forming the central figure, and in the hall of the rotunda is a historic collection of engraved medals and bronze reliefs, contributed by a lady of Stockholm. Norwegian women display articles of needle-work, wood-carvings, and feather mats, through an Illinois industrial society whose members are of this nationality. A native woman on snow-shoes, with a basket of shells on her arm, stands at the entrance to the booth, and in the model of a Norwegian cabin are grouped figures of peasant girls in holiday, bridal, and every-day attire, with city ladies in more elaborate costumes.

Soon after the Russo-Turkish war, Kate Marsden, an English woman and nurse of the Red Cross society, journeyed east to Siberia for the purpose of founding leper missions, and near the Swedish and Norwegian booths is a model of the village which she established in the province of Takutsk. It consists of two hospitals, a school, a church, houses for lepers, and their attendants, and workshops for those who retain the use of their limbs. Fronting the models, is a miniature of one of the miserable hovels in which she found a number of unfortunates lurking in their forest lair. In an adjoining booth the women of the cape of Good Hope display in neat designs their native grasses, shell and feather work, with musical instruments, brooms, pottery, and filigree work of Kaffir production, and figures of Bushmen in full dress.

Mexico has a large and tastefully arranged exhibit. In the centre of her section are several cases filled with fancy-work, including artificial fruits and flowers, and fashioned in blossoms and twigs



FROM FIBRE OF CENTURY PLANT, AZORES



NEW MEXICO



BELGIUM



RUSSIAN SECTION



RUSSIAN TAPESTRY

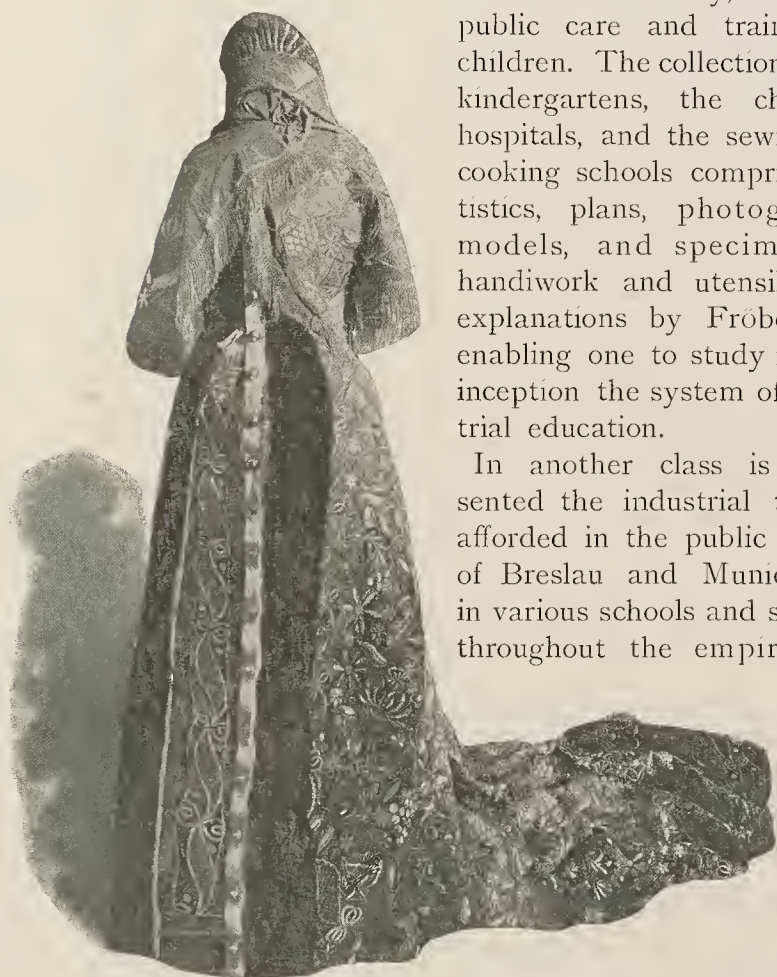
a ship under full sail, the latter made at a female school of art. The Ceylon tea-house is also an attractive spot, with its carved tables, its light draperies, its dainty cups of wood and china-ware, and its dark-eyed, native damsels. At one corner is a small case of dolls and fancy-work, contributed by the mission schools of the country, and across the passage-way, a more elaborate display of fine needle-work, from the school at Guntur, India, of which Lady Wenlock, wife of the governor of Madras, is patroness.

Beyond are the exhibits of Belgium, Austria, Brazil and Germany. Especially attractive among the light specimens of fancy-work, contributed by the women of Brazil, are the designs in vari-colored feathers and fish-scales. By Belgium's queen and the ladies of her court was mainly gathered a small collection of embroideries, laces, and works of art, the queen sending two water-colors of her own execution. Austria's embroideries are the most noticeable features of her display. At the entrance to her pavilion is a screen painted by the archduchess Maria Theresa, and within are excellent imitations of ancient Polish carpets.

By Germany was organized one of the most skilfully grouped exhibits in the building, largely due to the efforts of the president of her committee, Anne Schepeler-Lette, of Berlin, who for years has been a prominent figure in promoting the industrial education of women. The decorated china and leather, the laces, embroideries, and other specimens of needle-work were, as a rule, contributed by those who have received instruction in the industrial schools and societies of the empire. There is also an educational department, including higher in-

struction, domestic economy, and the public care and training of children. The collections of the kindergartens, the children's hospitals, and the sewing and cooking schools comprise statistics, plans, photographs, models, and specimens of handiwork and utensils, with explanations by Fröbel, thus enabling one to study from its inception the system of industrial education.

In another class is represented the industrial training afforded in the public schools of Breslau and Munich, and in various schools and societies throughout the empire. By



OLD TIME COURT DRESS, RUSSIA



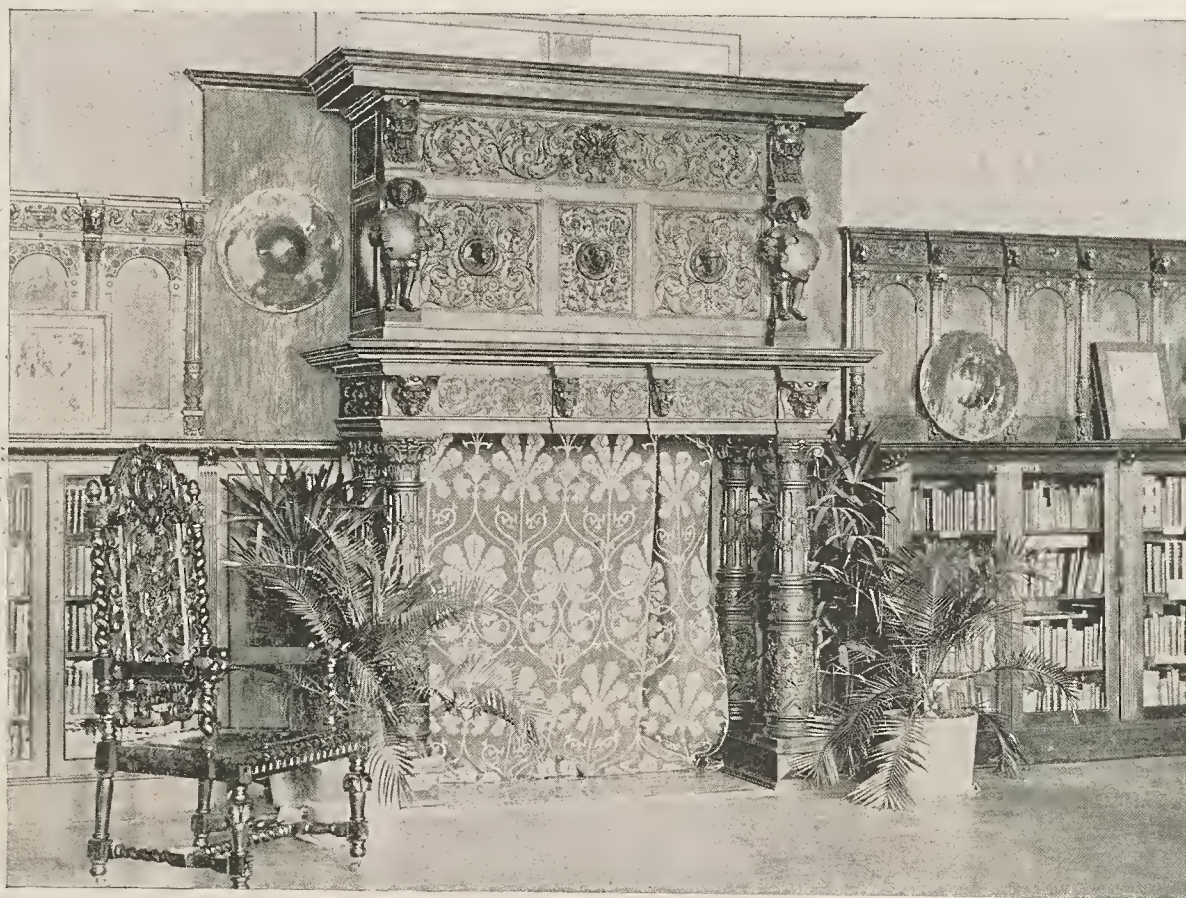
CONVENT DOOR, MOSCOW, MME DOORNOVO



NEW YORK ROOM, WOMAN'S BUILDING

the woman's society of Baden, with its numerous branches, is illustrated its methods of training young women and caring for dependent children. Photography, drawing, cooking, printing, laundry work, book-keeping and art industries, are taught in establishments connected with the Lette society, and embroideries, drawings, sewed garments, printed books, artificial flowers, photographs, and other articles are displayed as specimens of the pupils' work. Special courses in dress-making, as taught at various institutions, are illustrated by text books and paper models, while of domestic economy there are most interesting expositions. The committee which had the latter department in charge provided not only printed volumes bearing on the subject, but models of kitchens, cooking schools, and institutions for the education of servants and housekeepers. Samples of work produced by various charitable institutions, with a presentation of the professional labors of nurses, are also found in the German section, in the centre of which is the display of the Lette society, and above it a bronze bust of its founder.

Returning to the gallery floor, we find there, opening on the eastern and western corridors, the various committee, assembly, and reception chambers, whose decorative features have already been



WOMAN'S LIBRARY

described, together with the library and the exhibits of the British training schools. The northern section is occupied by the assembly room and the model kitchen, and on the south is the organization department, where are the headquarters of the industrial, educational, religious, and other associations of women. The space set



apart for this purpose, including nearly 12,000 square feet, is divided into more than sixty compartments by rails and curtains of blue silk, corresponding in color with the tints of the frescoed walls, and forming the only lines of demarcation between the exhibits of the various societies, thus giving to the entire collection a social and cosmopolitan aspect.

The largest area is occupied by the Woman's Christian Temperance union, representing more than 200,000 active members. On their walls are the banners of many local organizations, with portraits of such leaders in the cause as Frances Willard and Mary Clement Leavitt, the latter the first missionary to travel

around the world for the purpose of organizing societies in the interests of temperance and social purity. Here is a monster petition to which are still being added the signatures of men and women in every portion of the earth; also a huge globe covered with the cards of four million children living in forty-four countries who have taken the pledge of total abstinence. A corner of this section, decorated with Japanese designs, and containing a large pendent bell composed of discarded opium pipes, calls attention to this branch of the reform, earnestly prosecuted by the union in Eastern countries. The booth is handsomely equipped, and in its exhibits is sufficient evidence of the world-wide progress of the cause.

Adjoining this section is the booth of the Chicago Woman's club, whose membership includes many earnest workers in



WOMAN'S LIBRARY

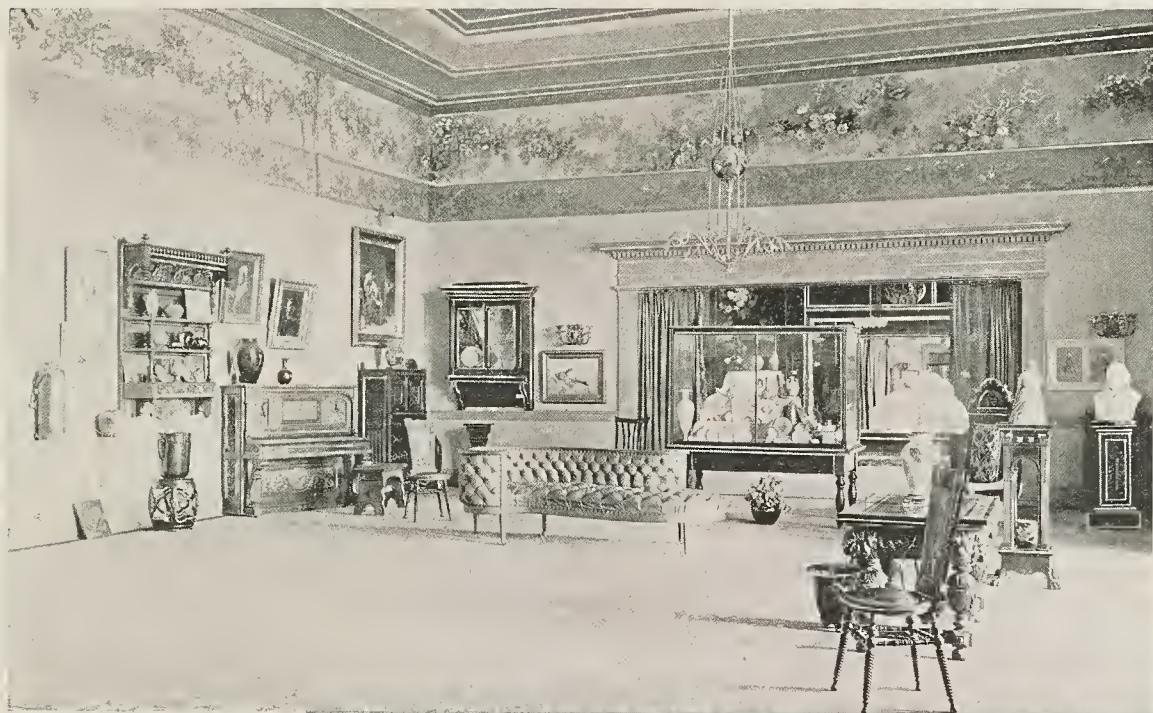
charitable, intellectual, and reformatory movements. Near by are the headquarters of the International board of the Young Woman's Christian association, whose central offices are in St Louis, and whose special object is to watch over the interests of young work-women. Among the homes erected for such persons, as shown by illustrations, the one in New York city is on the largest scale. From the forty branches of this association come exhibits of class work, and over each is the sign of the order, in the form of an ivory-tinted shield, finished in threads of blue and gold.

The booth of the order known as the King's daughters, whose silver cross has been carried into many far corners of the earth, is tastefully decorated with festoons and banners of purple, silver, and white. The order of the Eastern Star, an auxiliary to that of Freemasonry, unfurls a banner of black satin lettered in gold, and a symbolic sheaf of wheat. Its quarters are luxuriously furnished, with carpet of moquette, couches, and easy chairs.

Without attempting to follow any special order of procedure, attention may be called to the work of several associations, as illustrated in this department. Home and foreign missionary societies occupy a considerable space, the latter displaying many curios gathered in connection with their work.

Chinese women exhibit a banner of blue, gray, and gold, in honor of their American friends. A Japanese woman sends a robe, later to serve as her burial shroud, and over which are scrawled the blessings and consecrations of native priests. Converted heathendom has also contributed to the collection a Turkish prayer roll, and a Buddhist rosary.

There are here represented associations for the rescue of fallen women; and by one known as the Girls' Friendly society, under the auspices of the episcopal church, is illustrated the work



that it is doing, with a view to the protection of girls whose calling exposes them to temptation. In the booth of a Philadelphia society, whose members, excluded by sickness from contact with the world, console each other by messages sent through an official organ; in that of a Philadelphia home, whose purposes are revealed in its pictures and stories of crippled children, and in the quarters of the Woman's relief corps of Kan-



CORNERS IN CINCINNATI ROOM

sas, is shown what is being accomplished for the aid of those suffering from physical ailments.

Seventeen unions and a very large membership are represented in the exhibits of the Woman's Educational and Industrial association. Female suffrage is symbolized in various devices, as on the azure ground of the American flag, with the great star of Wyoming, and the smaller symbols of Kansas and Michigan. There is also the irrepressible figure of Susan B. Anthony, in bust and portrait form, and in the shape of souvenirs. In conclusion much may be learned in this department as to federations and councils of women, industrial institutes, schools for needle-work, flower missions, ceramic clubs, and literary, scientific, and philanthropic organizations, all of which find expression among these collections. Results are further illustrated in a book of statistics, compiled under the direction of the Board of Lady Managers, giving the names and membership of the different bodies, with the number of women employed in every branch of work, thus enabling the visitor more fully to appreciate the significance of the display.

The walls of the staircases and a few of them of oriental designs many portions are taste-which attracts general noted for its beauty associations, is a re-famous Norman tapest-town-hall of Bayeux. of a strip of linen, 200 two in width, with fig-worsted, depicting career of William the his departure from vasion of England. As fashioned by his wife, Matilda; little doubt that the tapestry whose events it depicts. The copy ridor, where also are the national costumes various provinces, with the dress grasses and wisps of hay, and yet said to be water-proof. In the north-eastern section of the gallery are the pictures contributed by Queen Victoria, and the princesses Christian, Louise, and Beatrice. In the northern corridor, from which open the large assembly room and model kitchen, is a chair of state from the Mexican government, and some rich tapestry work from London, and on the opposite side is a choice collection of French artistic embroidery.

A favorite resort in the Woman's building is the model kitchen, with floor of tiling, its gas cooking-range and

modern utensils, all scrupulously clean, and in the neatest order. During the sessions of the classes in cookery are submitted for the approval

of visitors specimens of their culinary skill, among them the lightest of muffins, corn-starch, and so-called Indian puddings. The kitchen is under the direction of Mrs S. T. Rover, of Philadelphia, by whom were recently introduced in European countries, in conjunction with a government agent, all the various products of maize; and to illustrate the many uses to which those products may be applied is one of the purposes of the exhibit. Some of the recipes were furnished by an agent of the Smithsonian institution, who procured them while living among the Zuñis.

The Woman's library, furnished by the

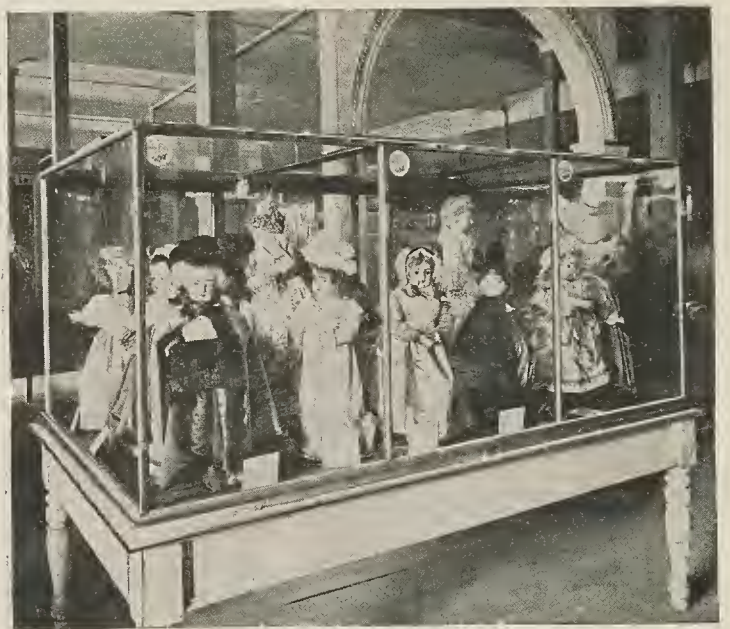
vestibules are adorned with tapestries, not sign, and of the galleries themselves fully embellished. A work

attention, but one less than for its historic production of the try contained in the The original is formed feet long by less than ures, worked in colored various episodes in the Conqueror, including Normandy, and his in-tradition relates, it was

but be this as it may, there is was made during the years forms a border for the eastern costumes of Spanish women, belonging of a mountaineer, made of long



CEILING, WOMAN'S LIBRARY



HISTORICAL COSTUMES, NEW YORK EXHIBIT



DECORATIVE WORK, MARYLAND



ART FANCY WORK, BUFFALO



CHICAGO ART WORK

John Boyd Thacher, forms one of the attractions of the library. Another is a cabinet containing forty-seven different translations and editions of *Uncle Tom's Cabin*, in front of which stands a bust of Harriet Beecher Stowe. An oil portrait of Mrs Sigourney and two leaves from her diary accompany the Connecticut books. Other American authors are also represented.

At either side of the library proper are the halls of Record, their walls covered with diagrams, charts, and tables containing much information as to the number of women engaged in the

women of New York, the ceiling decorated by Dora Wheeler Keith, contains some 7,000 volumes, written by women of every nation, and collected by committees in many states and countries. More than twenty-five nationalities are here represented in more than twenty languages, their dates of publication varying from 1587 to 1893. New York sends the largest collection of any of the states, France of the foreign countries, Great Britain and Spain the greatest number of rare books and manuscripts, the last a loan from the Biblioteca Nacional in Madrid. Some nations and states have sent also photographs and biographical sketches of their authors; others, as Sweden, bibliographies of the women of their country, and still others, as Connecticut and New Jersey, have printed handsome volumes containing representative articles from periodical writers, all prepared expressly for the occasion. New York's collection of club papers and periodical articles is type-written, and a marvel of completeness and mechanical execution. Nearly all these works are intended to form the nucleus of an international woman's library, to which additions will be constantly received. In the form of a card catalogue statistics have been prepared as to the career, education, and public work of each author, and when printed, will form a valuable biography of women.

A collection of autographs and portraits of women of France, Great Britain, and America, the property of Mrs



HOSPITAL AND PHARMACY, ILLINOIS SECTION



MRS McKEE'S INAUGURAL BALL DRESS, INDIANA

professions, their ratio of savings, mortality, and emigration, with other phases of their condition and career. In the corridors adjacent is an exhibit organized by prominent New York families, consisting largely of historic embroideries, miniatures, watches, snuff-boxes, fans, and laces.

But in the corridors the main attraction is the Keppel historic collection of engravings and etchings by women who have won repute in those branches of art. Among the first in chronological order are the plates engraved by Diana Ghisi of Mantua, between 1581 and 1588, most of them copies from Raphael, Tuccari, and Giulio Romano. France, Italy, Germany, and



CALIFORNIA ROOM

England all furnished skilled female engravers and etchers to the world of art, from 1535 to 1835, and specimens of their work are here on exposition. Many of them were the pupils of male relatives who had previously made their mark, and among them were Angelica Kauffman and Caroline Watson, the former a Swiss whose works were chiefly produced in England, and the latter engraver royal to Queen Caroline. Finally

in the form of a bust is a wood-cut by Marie de Medicis, bearing the date of 1573.

South of the library is the exhibit of the British training schools for nurses, the walls hung with portraits of women, who have been leaders in the work, and with busts and statues of others scattered throughout the apartment. Under a portrait of Queen Victoria is a statue of Florence Nightingale, and near it a bust of Princess Christian, president of the Royal British Nurses' association, with a statue of Sister Dora, and a bookcase containing her keys, scissors, chains, and other personal effects, such as remind us of her devotion and self-sacrifice. In a word, there is an entire gallery of celebrities, not least among which is the figure or bust of Rohere, the founder of saint Bartholomew's hospital in 1122.

In large glass cases are the exhibits illustrative of methods and appliances, among which are ligatures and bandages, thermometers for marking the temperature of fever patients, surgical dressings, ventilated corsets, hygienic shoes, and other articles of wear for the sick. District nurses and private nurses have their separate

outfits, as here illustrated, and in the ward baskets are most ingenious contrivances for packing articles into the smallest space. In the oil-silk bags of Queen Victoria's jubilee nurses are stowed the cordials and medicines with which they relieve the poor. Models of apparatus used in medical and surgical treatment, designed by an employé of a homœopathic hospital, form an interesting though painful study. The dainty lace caps worn by English nurses, the medals, badges, and decorations awarded for distinguished service in war and pestilence, and the models which represent the costumes worn in various hospitals, are also among the collection.

Adjoining the exhibit of nurses' schools is a room which contains the overflow from the New York collections. It consists of articles donated by colored women of that state, and was organized by a colored female commissioner who well represents the capabilities of her race. In one corner is jewelry made by the natives of



SHIELD OF COLUMBUS



CALIFORNIA ROOM



PELICAN CAPE, NEW ORLEANS



FANCY WORK AND DECORATIONS



PAINTED CHINA

West Africa, and elsewhere, specimens of cabinet work decorated in designs burned into the wood, with artistic embroideries, fans, and laces, and pictures in oil, water colors, and crayons. In the covers of a plush album is shown a sample of the first book-binding done by colored women.

Scattered throughout the Woman's building are striking illustrations of the revival of art needle-work, which in the middle ages was almost the only industry that occupied the minds and hands of women. In this modern revival, which is of comparatively recent date, England and the United States have taken the lead, and in this connection may be quoted a few extracts from an article contributed to the *Art Amateur* by Mrs Candace Wheeler, director of the department:

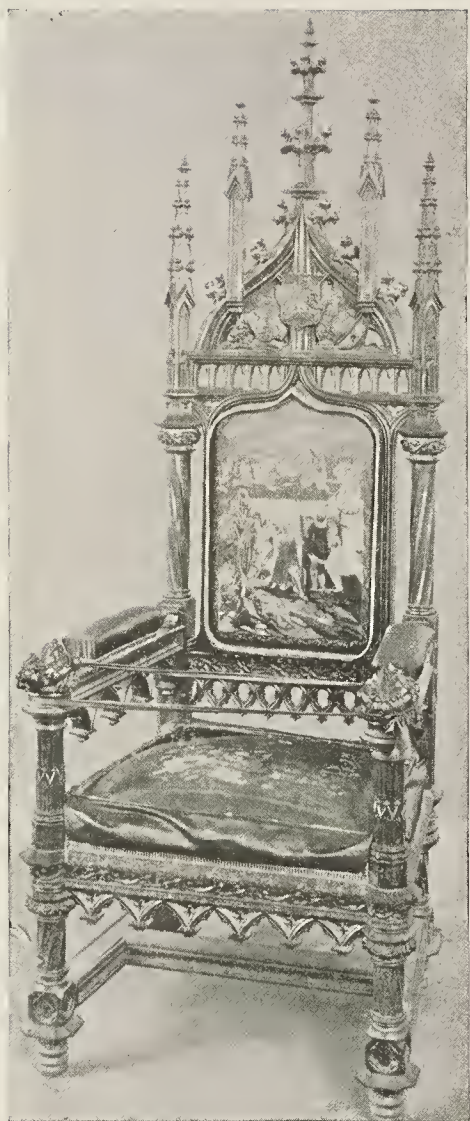
"The old and familiar art of needle-work, the art which began when Eve sewed fig-leaves in the Garden of Eden, the art which has been the heritage of Eve's daughters in all ages of the world, has never in history made so great a showing or illustrated so conclusively its claim to rank as one of the great arts of the world. The needle-work of all the ages is here—stitchery which goes back to the time of the Beauvais tapestry, that historical treasure whose archaic story-telling renders it too precious for presence even in the wonder-time of the Columbian Exposition, and makes a reproduction of it a thing of national value. There are embroideries which are precious from every point of view—from their antiquity, and the human interest which therefore attaches to them; from their methods, which have long been lost to the art; from the use of materials of a purity and preciousness almost unknown to modern manufacture, and from a color the subtlety of which only the painting of time can give, and which no dyes can rival. These qualities give a many-sided value, which dwarfs



FANCY WORK



EMBROIDERY, CHICAGO



OLD SPANISH CHAIR



CHARLES I PRAYER BOOK

The grotesque and wicked fancies of some of the miraculously wrought Chinese embroideries of the same date make these seem like holy pictures of Madonnas and saints, although no hint of figure is shown in the design. Convent embroideries form a class by themselves, belonging for the most part to the Italian school, and covering a large part of the lustrous, softly colored, and reverent needle-work of the fifteenth and sixteenth centuries in Italy. They are among the most attractive of all the antique pieces shown in the Columbian Exposition, and deserve almost individual notice and description."

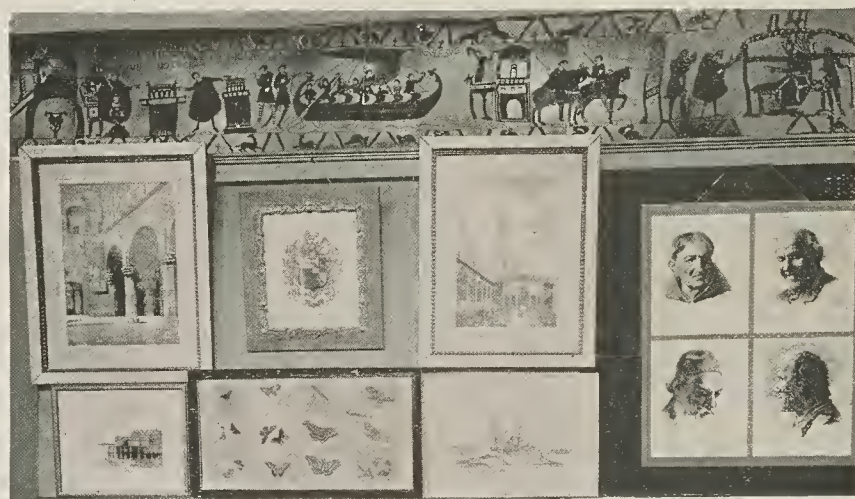
even the best and most earnest of modern effort.

"The first impression of all this collective wealth of embroidery is bewildering. One sees at a glance, almost, the first attempt side by side with the very latest development of the art. Examples of all countries as well as all times are here—of India, China, and Japan; of far-away Persia; of Russia, and Roumania; of Fayal, and Ceylon; of Greece, and Arabia; of South America, and Mexico—the work of all races of women, wherever they exist or have existed, and wrought out their quiet days with the needle, sitting under palm and pomegranate. It is comparatively easy to mark the great divisions; but even to the practical observer schools and countries, uses and demands, have widely differentiated the methods and classes of these divisions. What we broadly call eastern work will be found to have very different characteristics and features. Chinese and Japanese, Persian, Indian, and Turkish embroideries differ from each other as do those of Italy, France, Germany, England, and Northern Europe. Embroideries of all periods characterize themselves. As a rule, eastern productions keep their separate characteristics through succeeding periods, so that it is difficult to fix their dates except approximately, and by condition or by quite obvious effects of time. Ancient Persian, and comparatively modern Persian, ancient Indian, and Indian embroideries of a hundred or even of fifty years ago, have the same style and methods, and use the same or nearly the same materials. Chinese, Japanese, Egyptian, and other Eastern peoples have scarcely changed their subjects or methods in a thousand years.

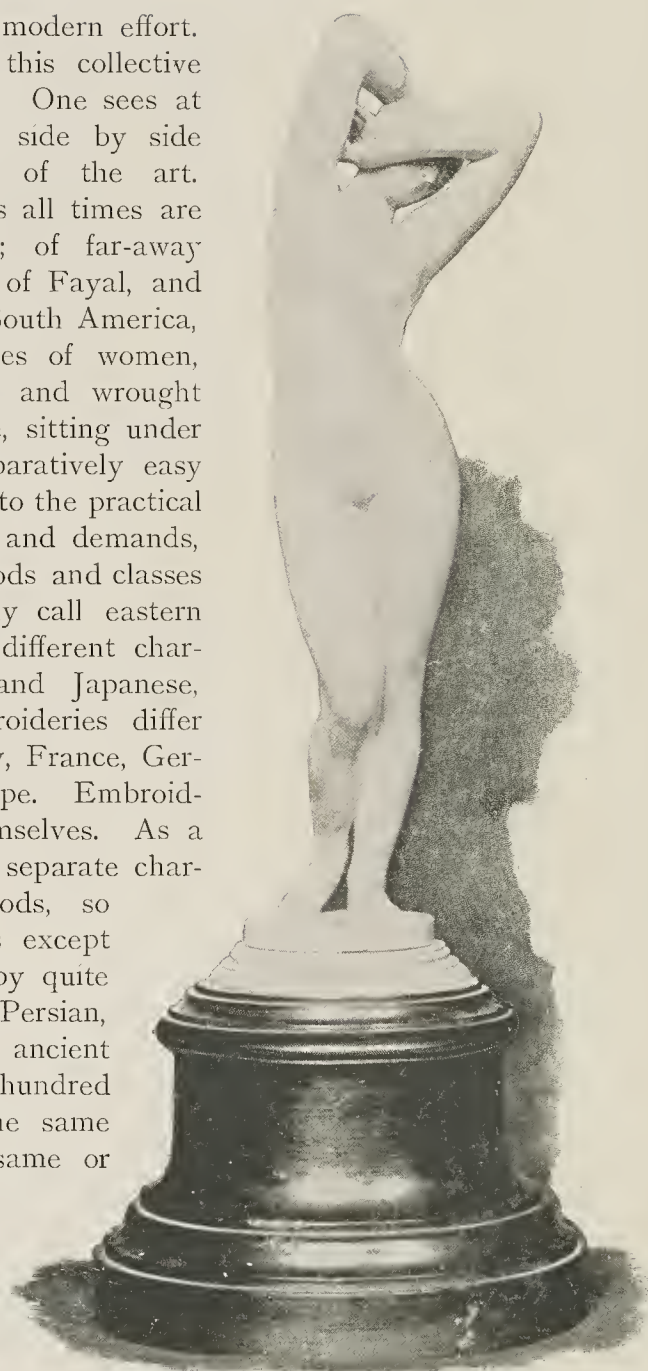
"Most of the antique embroideries of Europe are found in the shape of altar hangings and vestments, for in

the embroideries, as in the pictorial art of the early centuries, the Church was the great patron. Many of them were wrought in nunneries, and, in fact, could not be produced except in the quiet and uneventful life of the cloister, where color and stitchery made the one interest and contrast of colorless lives, and could therefore almost monopolize the thought of the inmate who produced them. There is certainly a peacefulness and repose of subject and treatment in these convent-wrought hangings

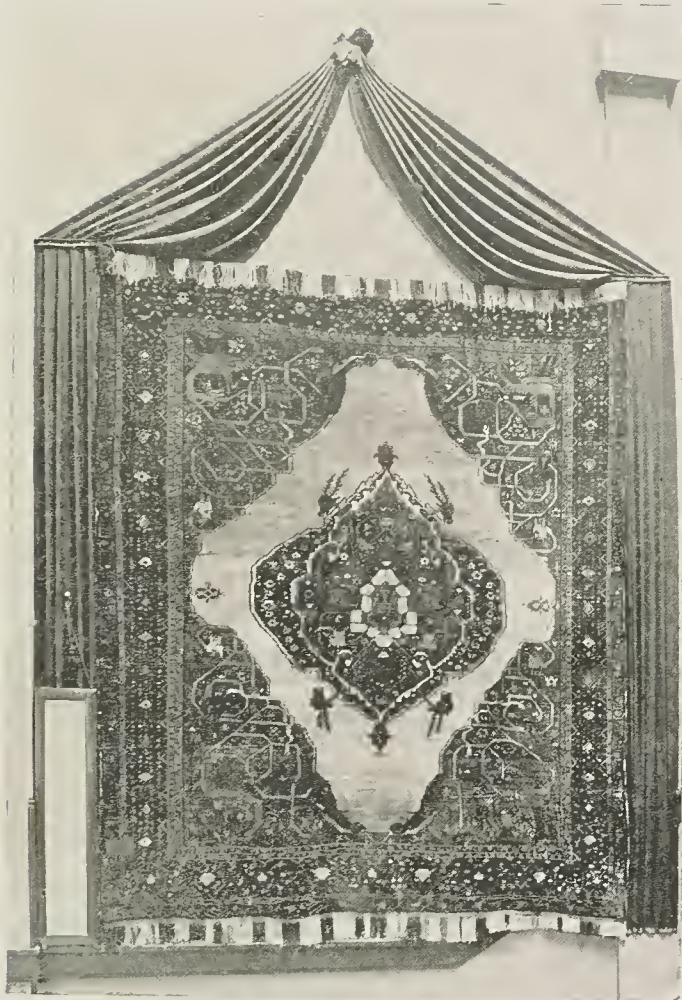
very greatly in contrast with other embroideries.



FRENCH ART



PHRYNE, FRENCH SECTION



TAPESTRY

Through the efforts of the Board of Lady Managers was built and furnished the Children's home, on ground adjoining the Woman's building, and forming of itself one of the educational features of the Fair. While intended mainly for the care of children too young to wander through grounds and buildings in company with parent or guardian, it is also in the nature of an exhibit, or rather of a series of exhibits, displaying the best of our nineteenth century methods of rearing and training children. First, may be mentioned the model crèche, whose quarters are in a spacious,



FRENCH COAT OF ARMS, GOLD AND VELVET

airy, and well lighted chamber, and where are shown from the earliest stages of infancy, the cradles and children's clothing of every age and nation, with the garments best suited in pattern, and material to the health and comfort of the child, and with brief lectures on these and kindred topics. Here, at a nominal charge, children are fed, amused, and cared for, the babies in an adjoining nursery, and older children according to age and conditions. In another apartment is a play-room suitably equipped, and there is a dining-room, kitchen, laundry, and drying room, all conveniently arranged.

Then comes the kindergarten, furnished and managed by the International Kindergarten association, with modern apparatus, and with object lessons of value not only to children but to those intrusted with their care, whether as mothers or teachers. In connection with the kindergarten is the kitchen garden, where, by the founder of this system, pupils are instructed in cooking, and other household work, but in such interesting method, that their labor is one of pleasure. There are also classes in physical culture, a gymnasium, an assembly hall, a children's library, and a special department, equipped by the women of Pennsylvania, where may be observed the process of imparting to deaf mutes the faculty of speech.

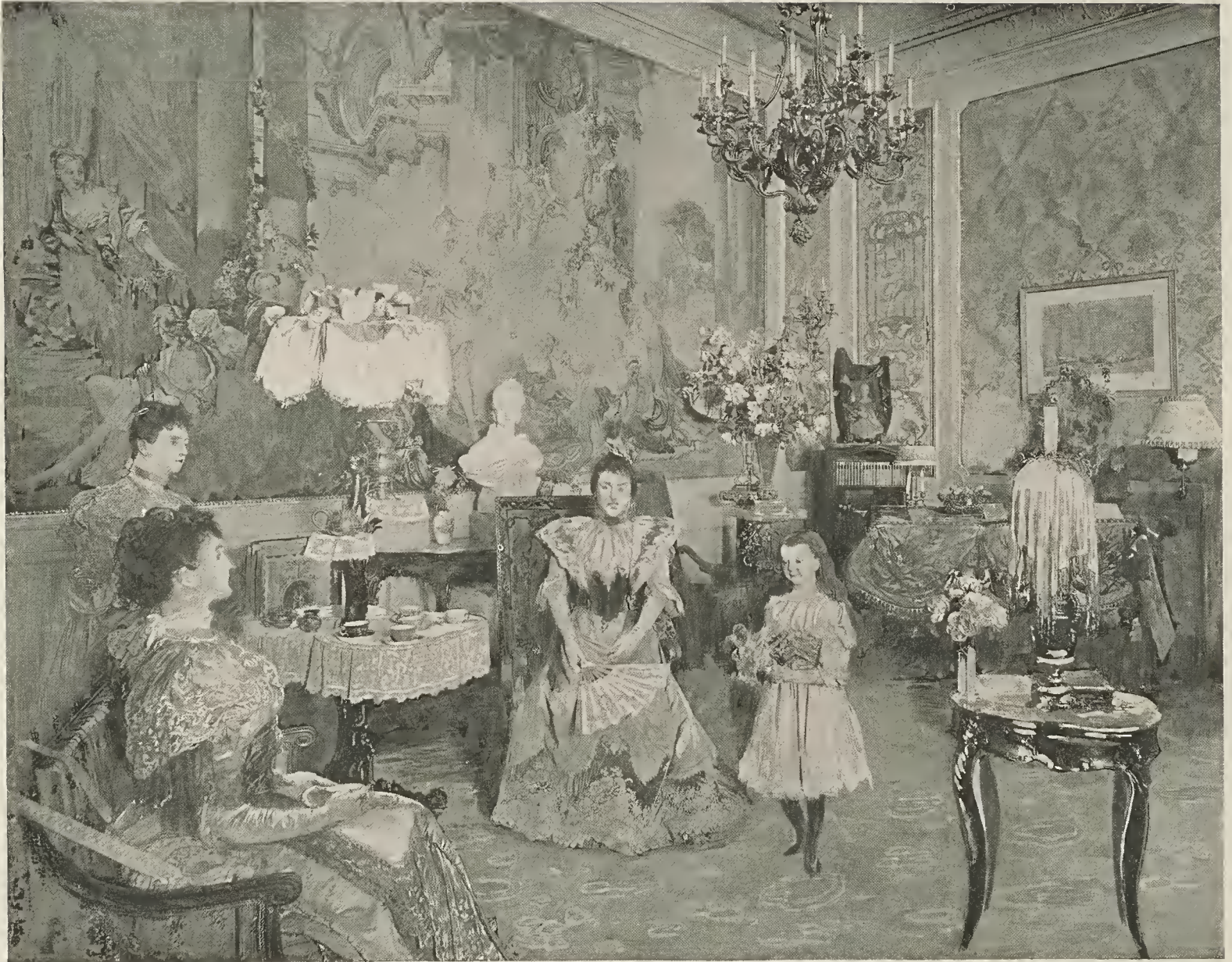
The gymnasium in the centre of the interior court is furnished with dumb-bells, bars, swings, vaulting horses, and other appliances for the physical education of children. In cases and on stands around the gymnasium is a large collection of toys of many varieties, from those



QUEEN AND PRINCESS OF DENMARK EXHIBIT



FRENCH RECORD ROOM



FRENCH SALON



FRENCH PORCELAIN



FRENCH RED CROSS EXHIBIT



SWEDEN'S EXHIBIT

of ancient and savage nations to the most recent devices fashioned for the amusement and instruction of childhood. There are the Punch and Judy and Mother Goose of England, shaggy-haired dogs from Russia, dolls and furniture from France, kite lanterns from China, and on the second

floor, Japanese models of acrobats, and domestic gods, with samples of articles used in various national games. An elaborate display represents a child's Christmas in Spain, with models of lordly castles and humble cottages, tiny figures of children engaged in the festivities of their country, and a wide expanse of miniature landscape. At one of the entrances is an Indian wigwam filled with native toys, and at another kindergarten literature, and a book composed of autographic inscriptions dedicated to children, among them contributions from Oliver Wendell Holmes, Canon Farrar, the Shah of Persia, George W. Cable, and Rudyard Kipling.

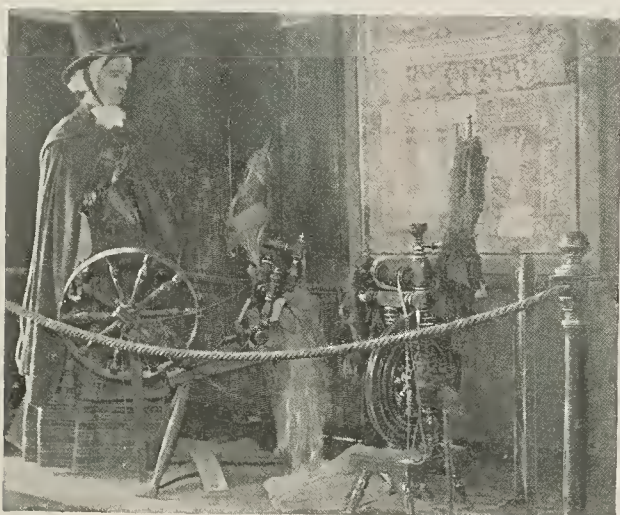
For older children more solid entertainment is provided in the assembly hall, where are lectures or talks on various topics, and especially on foreign lands, as represented at the Fair, many of them illustrated by the stereopticon. Then, under proper care, they are permitted to view the collections of which the lecture treats, and thus to compare what they have heard with the exhibits of the country described. The outer walls of the library are covered with the sketches and manuscripts of authors who have made juvenile literature a specialty. To these and to the collection of books, selected and arranged with reference to age and capability, some of the publishing houses contributed. Of magazines and periodicals, principally American, English, French, and German, there is also a large assortment.

In one of the apartments instruction is given in the arts of wood-carving and clay-modelling, and in another is illustrated the process of teaching the deaf and dumb. In the latter children four or five years of age are taught to observe the movements of throat and lips, and the expressions of the face, in the articulation of words; for it is the theory of their instructors that, if taken in time, no case

is hopeless, unless there exists some physical deformity of the mouth. There is also a room where the Ramona Indian school, of Santa Fé, New Mexico, displays its methods of teaching native children, a class of girls furnishing the living material for the illustration. The school was named after the novel written by Helen Hunt Jackson, and was partially



FRENCH LACES



WELSH SPINNING



BABY RUTH'S PRESENT FROM SWEDEN



WEST ENTRANCE TO WOMAN'S BUILDING



INTERIOR CHILDREN'S BUILDING



SIDE PANEL PAINTINGS

modelled in accordance with the theories therein advanced. On the gallery floor Charity is represented in this sphere of her mission by a group in marble from the atelier of Lorado Taft, a woman on bended knee parting in tears from her child, which nestles in the arms of the central figure, as with words of cheer and comfort she bids adieu to the sorrow-stricken mother.

As with the entire display of Woman's industry and art, so with its Children's home, we have here a feature of the Exposition, of general, as well as of special interest. Just as the manufacturer, the machinist, or the electrician may study in their several departments, the highest achievements of the inventor or the mechanic, so may all classes of visitors observe in the Children's building the most improved and enlightened methods for the rearing and education of children. In its crèche, its kindergarten, its kitchen-garden, its playground, gymnasium, library, assembly-room, workshop, furniture, and even in its toys, are illustrated the best and most recent appliances and methods which our nineteenth century civilization has evolved for the training of those who are soon to take our places in the arena of life, now demanding, as never before, that he who enters the lists should be fully equipped for the struggle.

Beginning with the crèche, where, in an airy and cheerful apartment, are shown the most rational modes of dressing and caring for young children, there is placed before us all that conduces to physical, intellectual, and moral development, all that expands child-nature and

gives to child-life a healthful and vigorous growth. In the kindergarten and kitchen-garden are object lessons of practical value to mothers and teachers; the former a play-school where instruction is conveyed in entertaining form,



SIAMESE PAVILION



SCREEN, SIAM



POTTERY EXHIBITS



FANCY WORK

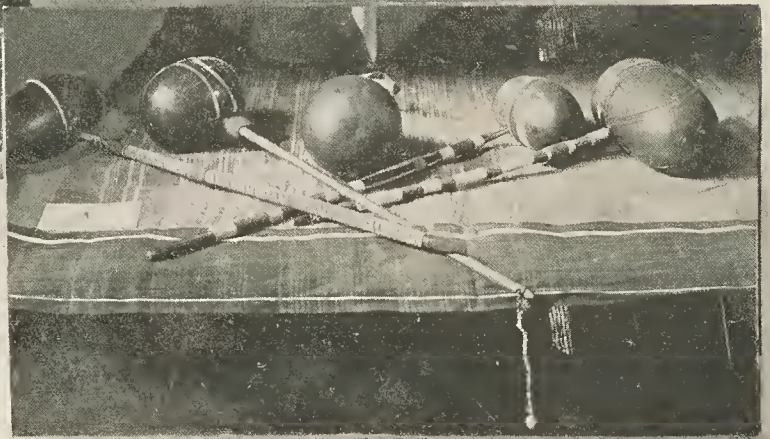
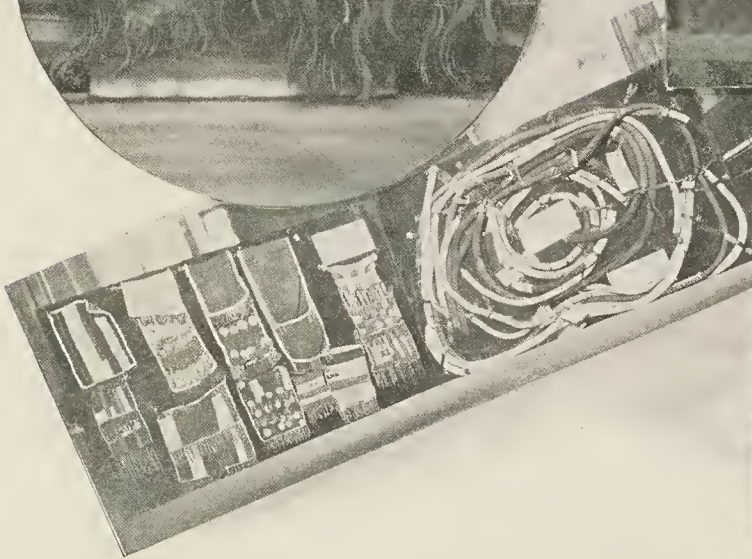
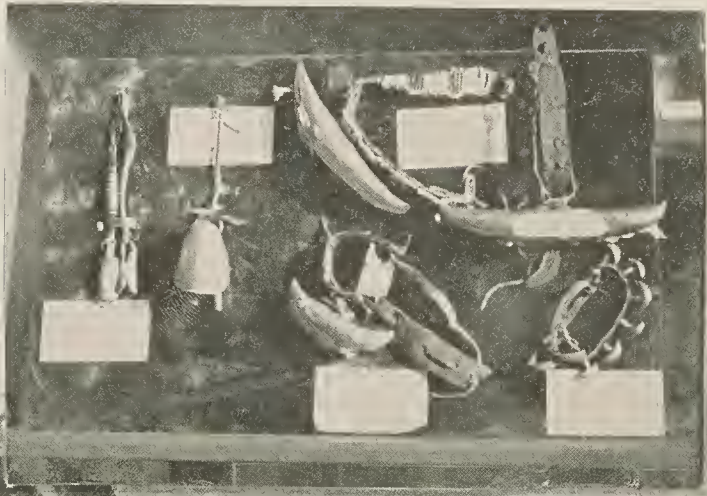
and the latter also a place of recreation where young girls take a pride and pleasure in learning the art of housekeeping. So with the school for slojd, with its exhibit of wood-carving, and the classes for physical culture, in connection with the American Turner-Bund. The library is also a most attractive feature, with its tasteful and comfortably furnished room, its books and periodicals from many lands, and in many languages. To gather this collection was of itself a task of no slight difficulty, for publishers refused, as a rule, to contribute, overburdened as they were, with solicitations from other quarters. But the managers were equal to the occasion, and addressing letters to American and European writers in the line of juvenile literature, thus secured, as a nucleus, a large number of authors' copies and autographs. To these, many others were added, including illustrated works, magazines, and newspapers, manuscripts, sketches, photographs, prints, and portraits. All these were selected, as far as possible, from the standpoint of the child, and not of the adult, such works being placed on the shelves and tables as children loved to read, and not as their elders might wish them to have.

Such is one of the many good works that the Board of Lady Managers has accomplished, and this it has done through its own unaided efforts, formulating its plans, erecting and furnishing its building, and raising the



SCHOOL CLASSES, CHILDREN'S BUILDING

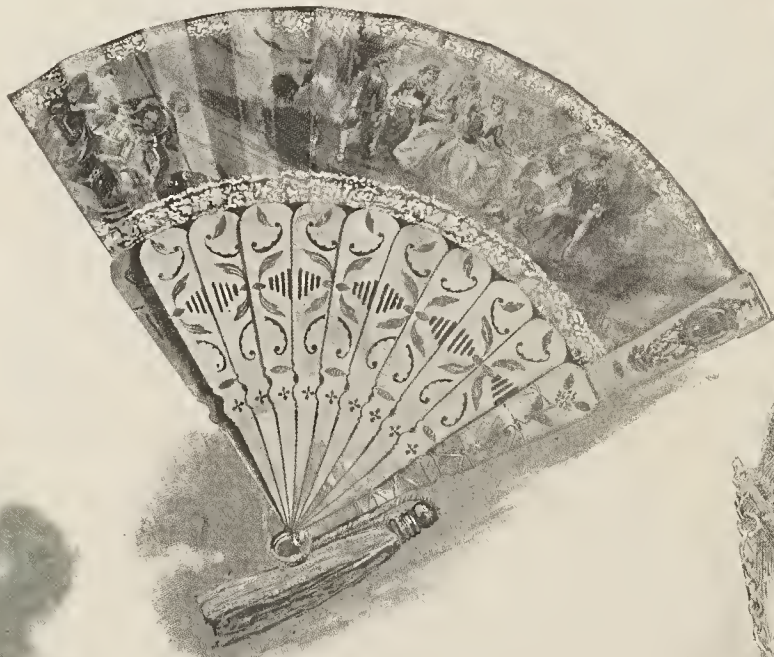
funds entirely through its own exertions, for by the Exposition management not a single dollar was appropriated for the purpose, this not from indifference but because not a dollar could be spared from its treasury. To get together this Children's home that nestles almost under the eaves of the Woman's edifice, was in truth an undertaking that taxed to the utmost their already overstrained resources; but it was to them a labor of love, and in the gratitude of thousands of children, of thousands of mothers, in the unspoken but none the less heartfelt sympathy of millions of visitors from every quarter of the world, they have found a just reward. Says one of the contributors to a recent work on the Woman's department, written by members of the board or by those who have their cause at heart: "It has been at a great outlay of time and strength that the money for the Children's building has been raised and judiciously expended; but no one of the many workers who have contributed these building materials, time, and strength, have grudged the costly sacrifice they have made. We believe not only that the children who enjoy our building's hospitality will be benefited by our work, but that the children in every state of this republic, in every country of the world will directly or indirectly profit by it, and in this



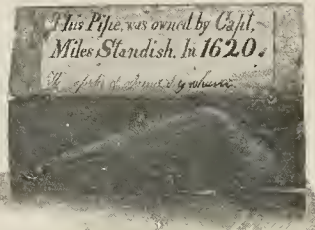
MRS FRENCH-SHELDON'S AFRICAN EXHIBIT, WOMAN'S BUILDING



FRANCISCAN COPPER CENSER



COLONIAL FAN



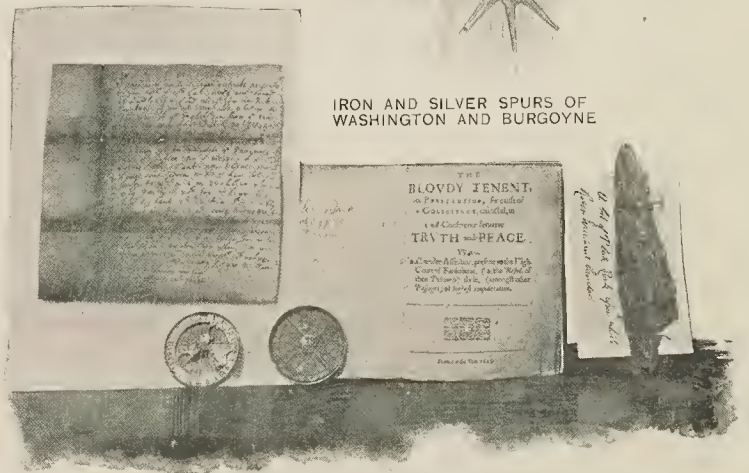
MILES STANDISH RELIC



IRON AND SILVER SPURS OF WASHINGTON AND BURGOYNE



PATTENS, 200 YEARS OLD



RELICS ROGER WILLIAMS

LADY MANAGERS' COLONIAL EXHIBIT, GOVERNMENT BUILDING



PROVINCIAL SEAL OF NORTH CAROLINA



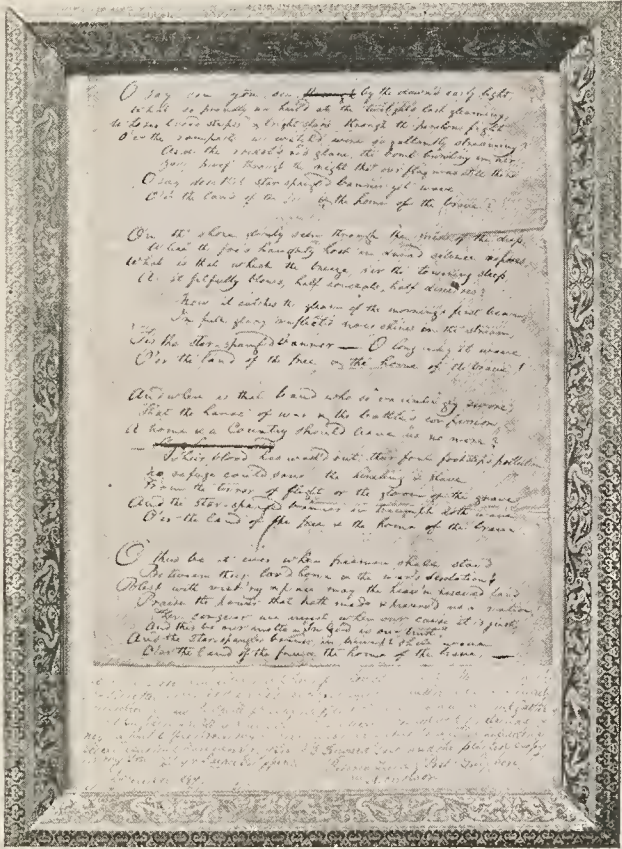
MORAVIAN COLLECTION, 1760



GREEN SILK UMBRELLA, FIRST BROUGHT TO AMERICA



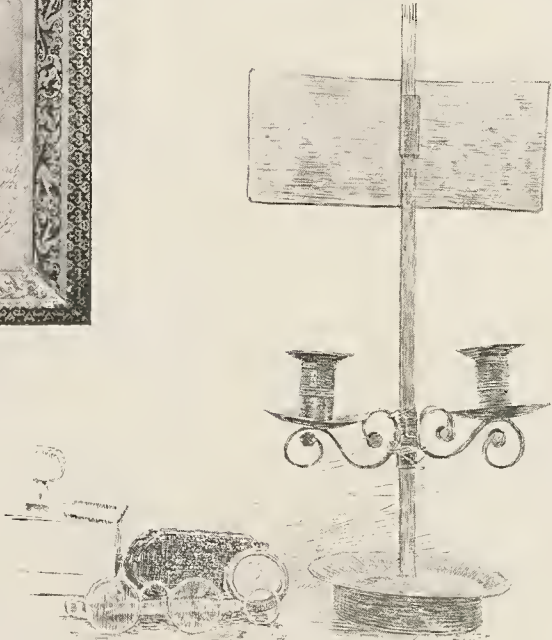
COMMODORE PERRY'S PITCHER



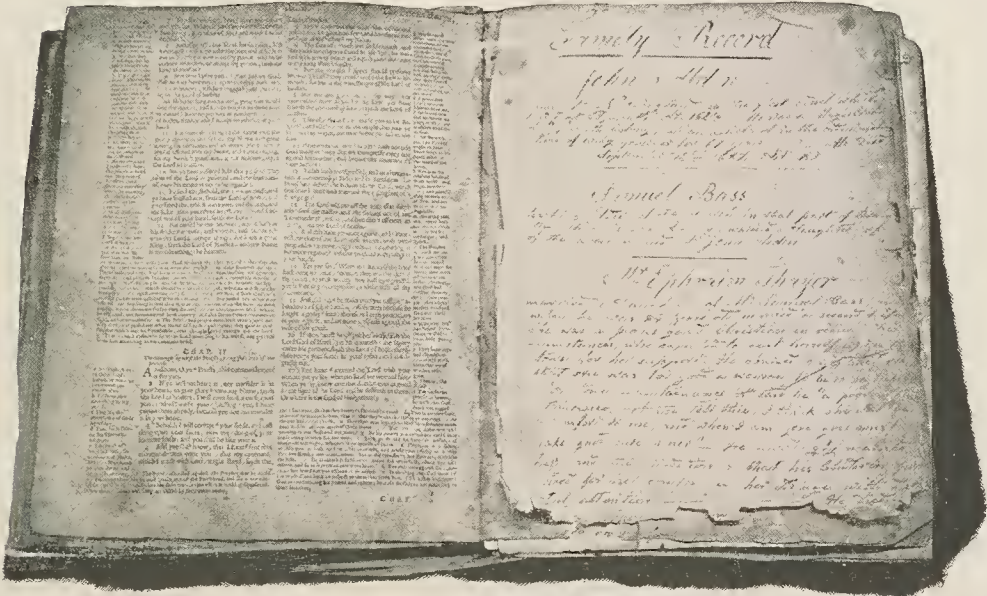
MANUSCRIPT STAR SPANGLED BANNER



CREAM PITCHER, LOVING CUP, AND TEAPOT



ELLERY RELICS AND CANDLESTICK USED BY WASHINGTON



JOHN ALDEN FAMILY RECORD



THE VERNON HOUSE



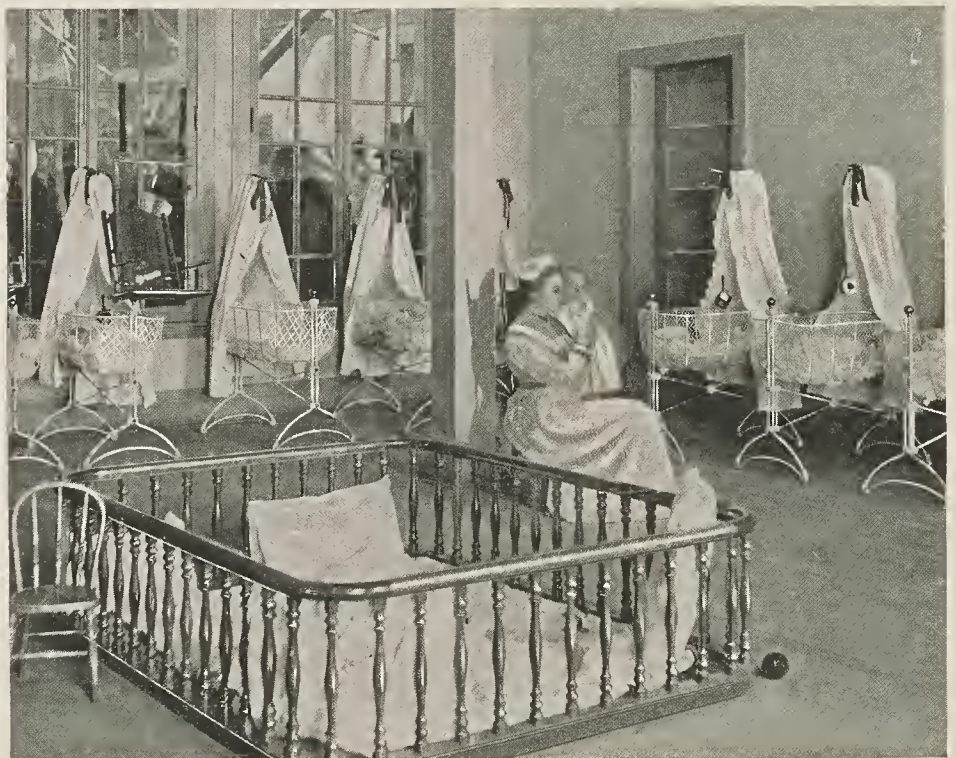
KITCHEN GARDEN, CHILDREN'S BUILDING

branch of human endeavor, where is felt the all-pervading influence of woman's hand, and heart, and brain. Never before has been offered to the world; never before has been attempted so full and exhaustive a representation of feminine achievement, and capability. And especially do these collections illustrate the progress in this direction of the United States; for nowhere else have the disabilities of women been so largely removed; nowhere does woman play so prominent a part as a bread-winner, as a competitor with man in the several vocations wherein she is fitted to compete.

If in the United States the number of bread-winners is smaller than among European nations, it is because there is less need for them to earn their bread, though many do so from choice, or for what Burns has described as the glorious privilege of being independent. On the other hand there is no country in the world where the avocations of women are so diversified or so

happy result we shall find an ample recompense for what we have done."

Thus has the Board of Lady Managers, in conjunction with state and foreign boards, representing the most advanced and enlightened views of woman's sphere and woman's work, presented a complete exposition of what women have done, and are doing in the cause of their sex, in the cause of home, of education, charity, science, art, and in every



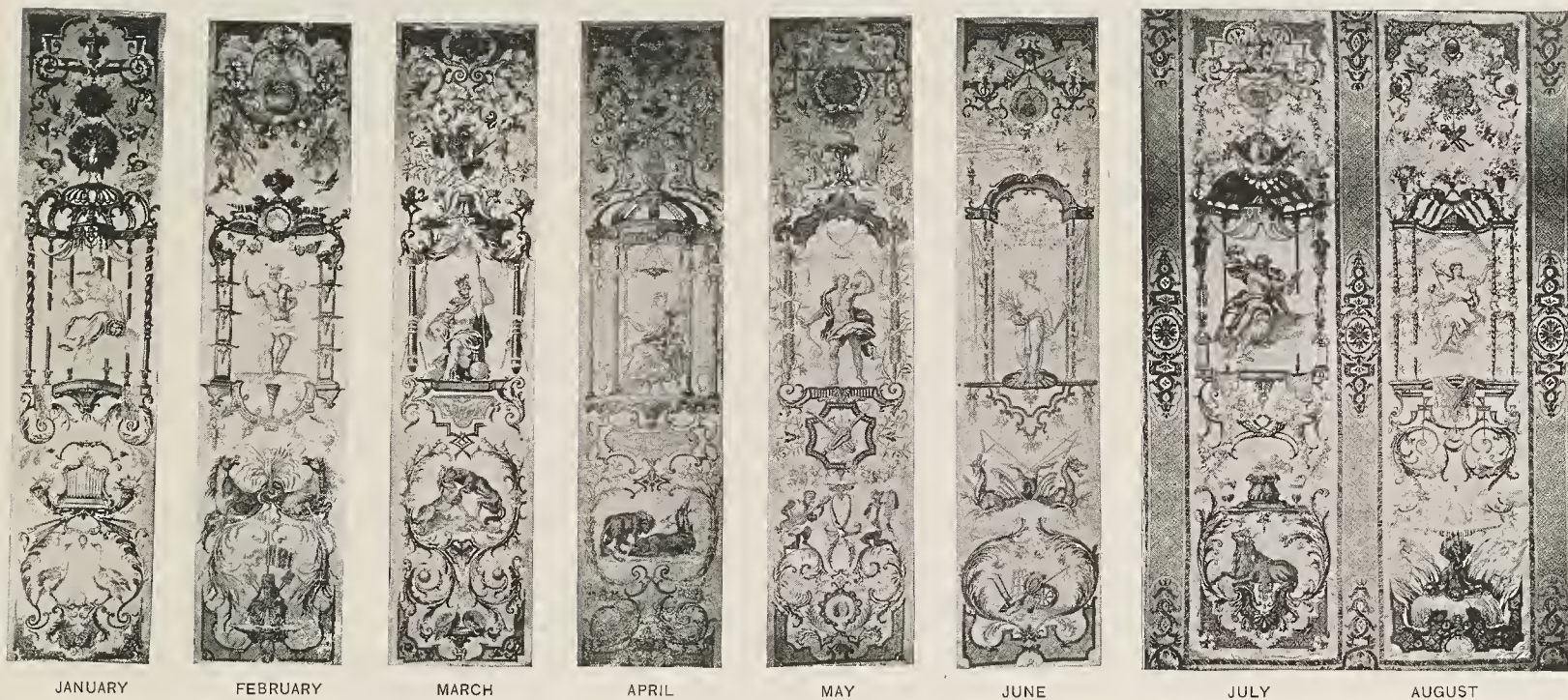
CRÈCHE, CHILDREN'S BUILDING



ILLINOIS WOMAN'S HOSPITAL AND PHARMACY

largely represented in commercial and professional circles. According to recent data there are nearly 3,000,000 women and girls who are self-supporting, many of them contributing to the support of others, and with at least an equal number who provide in part for their own maintenance.

Of these more than 14,000 are at the head of business firms or conduct a business of their own, and 26,000 are employed as clerks and book keepers. Of school-teachers there are 155,000; of teachers of music and professional musicians, 13,000; of physicians and surgeons 2,400, and of chemists and pharmacists nearly 2,000. Of



journalists there are 600, of authors known to fame about half that number, while more than 200 are practising lawyers or architects. But most remarkable of all is the number engaged in farming, planting, and stock-raising, in which pursuits no less than 59,000 women are represented. Such is the part that woman plays in the great workshop of our western republic, as, with the lapse of years, she rises slowly but surely toward the higher plane of her destiny.

One by one the disqualifications of women have been laid aside, their legal rights asserted, and acknowledged, so that in many of the states they share nearly all the political privileges and civic duties pertaining to citizenship. In Wyoming, Washington, and Utah women may vote and serve on juries; in Kansas there are municipalities where the office of mayor has been filled by women; in Pennsylvania they may be appointed masters in equity, and in New York, Massachusetts, Connecticut, and in several of the western states as notaries public, commissioners of deeds, administrators, and executors. By the general government they may be commissioned as post-mistresses, army surgeons, captains of steamboats, and even as United States marshals. With some exceptions, our leading universities have not been slow to recognize the claims of women to such opportunities for higher and special branches of education as are accorded to men. At many of the law schools, the schools of medicine, surgery, dentistry, music, and the fine arts, women are trained and graduated, one department only closing its doors against them, and that is the department of theology. Thus, it will be seen that women can no longer be excluded on the ground of mental inferiority, and those who would advocate such exclusion must do so on other grounds.

"Women," says Ariosto, "have risen to high excellence in every art whereto they have given their care." And never since these words were written has been presented, until this year of 1893, a complete exposition of what woman has done, and is doing in the great workshop of the world. Here is in truth a complete and life-like representation of woman's condition among all the nations of earth, one relating especially to the great army of wage earners, many of whom labor under adverse conditions, their task injurious to health, and their daily pittance barely sufficing for their daily bread. But here is also shown how women may find more congenial and profitable sources of employment, may learn how best to prepare themselves for new opportunities, and how to take advantage of them, each one according to her ability.

Of all the lessons of the Exposition there are none that will be longer remembered than those which the Woman's department has taught us, and to none is more credit due than to the Board of Lady Managers, forming, with its associated boards, an organization of women for the common benefit of woman-kind such as has never before existed in the history of the world. Theirs was the hardest task of all, and never perhaps was success more hardly won; never were the barriers of prejudice and apathy more difficult to overcome.



THE MONTHS, DEPICTED ON SATIN IN THE FRENCH SECTION

From oriental countries especially came most discouraging reports; for there were neither schools nor women with intelligence equal to the work. Many European countries were at first indifferent though later responding nobly to the invitation. Says the president of the Board: "We travelled together a hitherto untrodden path; we were subjected to tedious delays; and overshadowed with dark clouds which threatened disaster to our enterprise. We were obliged to march with peace offerings in our hands, lest hostile motives should be ascribed to us. When our invitations were sent to foreign lands, the commissioners already appointed generally smiled doubtfully, and explained that their women were doing nothing; that they would not feel inclined to help us, and in many cases stated that it was not the custom of their country for women to take part in any public effort."

But to the women of every land, to women who have near at heart the cause of their sex, who would not merely live a life of ease, without a thought for their less fortunate sisters, personal letters were addressed soliciting their coöperation, and with most favorable results. Then it was that what had been merely a hope began to assume reality, and, continues the president, "our burdens were greatly lightened by the spontaneous sympathy and aid which have reached us from women in every part of the world, and which have proved an added incentive and inspiration." When first the Woman's building was designed, the managers were somewhat doubtful as to filling its space with creditable exhibits; but long before it was opened, applications were made for four or five times the available room, thus permitting a selection of the choicest and most attractive specimens of female work. Most fitting it is that the best of these specimens, including the Woman's library should find a permanent home in a memorial building, there to serve as a nucleus for still more valuable collections.



SEAL OF BALTIMORE

WORLD'S FAIR MISCELLANY.—Adjoining the western vestibule of the Woman's building is a bureau where women are specially employed to furnish information or to act as guides through the grounds and buildings, and, if desired, through the city. The parlors and reception rooms were arranged and furnished with a view to the comfort and convenience of visitors, all of whom are permitted to use them free of expense.

In the rotunda of the Administration hall is a model of the treasury building at Washington, constructed of souvenir half dollars, twenty feet long, eleven in width, and four in height, placed there since the foregoing part of this work was put in print.

The correspondence maintained by the Board of Lady Managers was second only in bulk to that of the department of Publicity and Promotion, and included in its scope all social, charitable, reformatory, educational, literary, and art associations, together with

women's exchanges, unions, and alliances of whatever description, throughout the United States, and in many foreign lands.

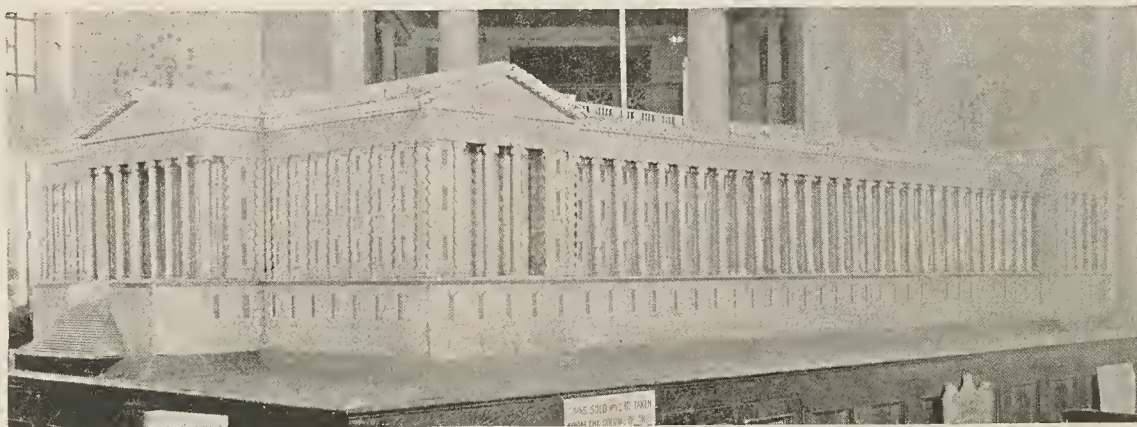
It was early determined that awards in the shape of medals or certificates should be made by juries or examining boards, in token of merit only, and as an acknowledgment of progress in the art or craft represented in the exhibits.

For the sale of exhibits by individuals, woman's exchanges, educational unions, and decorative art societies, a coöperative system was arranged, each association or individual paying its

proportion of the expenses. Twenty per cent is charged on all sales effected by employes of the management. None of the articles sold could be removed until the close of the Exposition except through concession granted by the committee on ways and means, and all articles admitted for sale must either represent the original work of exhibitors or such as their work had largely increased in value.

The so-called golden nail, driven home by Mrs Potter Palmer at the dedication ceremonies, was made of pure copper, silver and gold. It was designed as the cross-bar of a brooch fashioned in the form of a shield representing Montana's state seal and coat of arms. In the foreground is a waterfall, behind which is a range of mountains wrought in copper, and encircled by a sunset effect in gold. The brooch is enclosed in a band of gold, with a farmer and prospector on either side, the former grasping a golden rake, and the latter a golden pick. In the centre, between these figures, is a Montana sapphire, appearing like a star in the sky depicted beneath. At the conclusion of the ceremonies the nail was withdrawn, returned to its place behind the brooch, and both were presented to Mrs Palmer. The hammer used on this occasion was a handsome piece of workmanship furnished by the women of Nebraska.

Forty thousand souvenir coins, with a face value of a



MODEL IN SOUVENIR COINS OF THE U. S. TREASURY BUILDING



HARRIOT'S HISTORY OF ROANOKE ISLAND

quarter of a dollar, were issued from the government mint for the use of the Board of Lady Managers. On one side is a woman with a distaff, the figure encircled by the inscription, Board of Lady Managers, Columbian Quarter; on the reverse side a profile of Queen Isabella, after whom the coin was named.

At a meeting of the Board of Lady Managers, on July 31, 1893, it was resolved to establish a building fund for the erection of a permanent structure commemorative of the work of woman at the World's Fair. It was agreed to reserve as a nucleus for the fund the premium realized from the sale of the Isabella souvenir coins, amounting to \$30,000, and to this sum Mrs Potter Palmer added her salary, amounting to some \$9,000.

Affixed to all the official documents of the New York Board of Lady Managers is a seal which recalls an oft-told tale in connection with the Columbian discovery, yet one which women love to repeat.

laundry work and pure soaps, with a collection of books containing information as to the various branches of domestic and industrial work.

Kate Marsden, the English nurse of the Red Cross society, whose work among the lepers of Siberia, as elsewhere noticed, attracted so much attention, made a journey of many thousand miles by cart, sledge, boat, and on horseback, to find a certain herb said to be a specific for leprosy. On reaching the district where it grew, she found it to be of no value. The book describing her experience, and entitled *On Sledge and Horseback to Outcast Siberian Lepers*, created a sensation when published in London. Princess Christian presented Miss Marsden with the badge of the Royal British Nurses' association, and she was elected a fellow of the Royal Geographical society.

Mrs French-Sheldon, whose African expedition is mentioned in the text, travelled through the dark continent with a caravan organized and equipped at her own expense. She was unattended,



CHILDREN'S BUILDING

The design represents an Indian woman standing upon a rocky shore, gazing anxiously seaward, and waving a torch high above her head, thus idealizing the story that the light which Columbus saw was the signal with which an Española spouse beckoned homeward her belated lord.

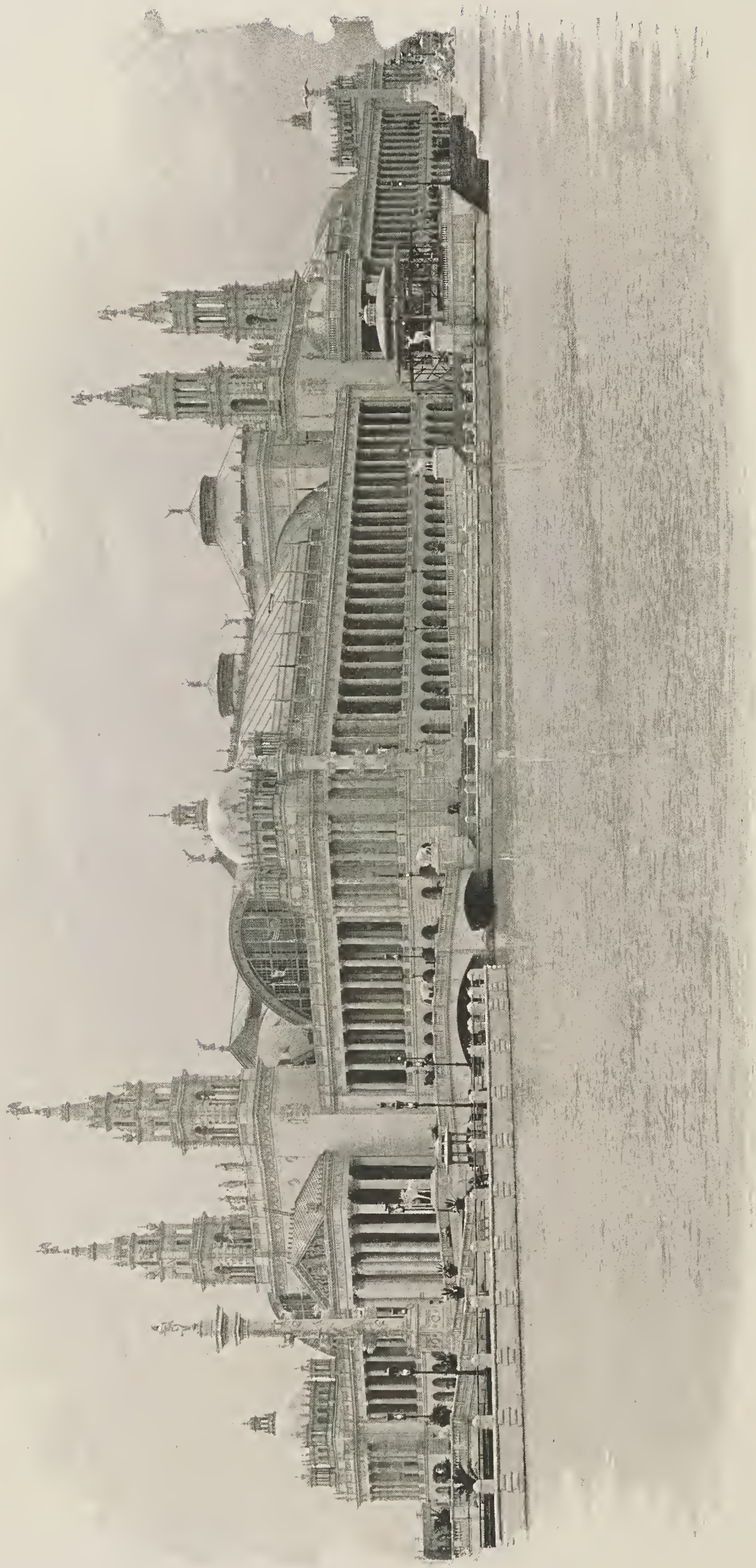
The collection of antique and other laces in the Italian section is one of special interest, representing, as it does, a history of the art of lace-making from its earliest inception. This forms one of the most valuable collections extant, many of the specimens being worth from \$12 to \$80 a yard according to width and pattern. There are also copies of historic laces, including some of the queen's laces, one of them presented to her niece, the Princess Letitia Buonaparte, on the occasion of her marriage to a younger brother of the king.

Worthy of note in the educational section is an exhibit by the Pratt institute, of Brooklyn, including rugs, draperies, portieres, wall-papers, and silver-ware, designed by its graduates, and manufactured by various establishments. Wood-carvings and costumes for women and infants were supplemented by various illustrations of the practical application of domestic science. Tests are given for detecting the presence of arsenic in paper-hangings, and upholstery, and of deleterious substances in baking powders, and washing fluids. Then there are charts of a model kitchen, and specimens of fine

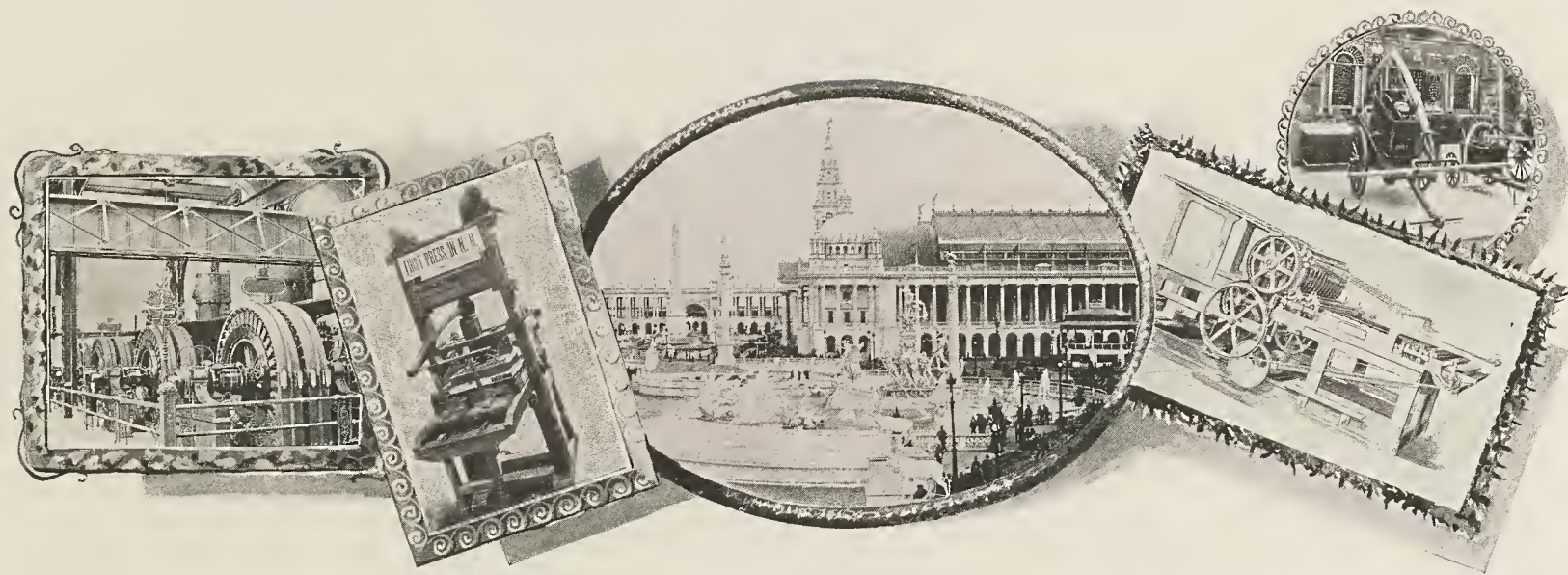
as I have said, by any of her sex, her party consisting of 200 porters, who carried the provisions and outfit, with presents for distribution among the tribes. The palanquin in which she lived and wrote is displayed in the Transportation building, and most of the curios collected during the journey are in the ethnological section of the Woman's department.



THE HAMMER AND LAST NAIL

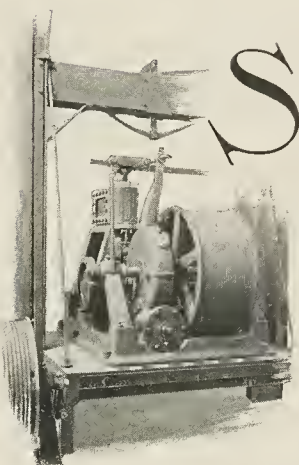


PALACE OF MECHANIC ARTS



CHAPTER THE TWELFTH

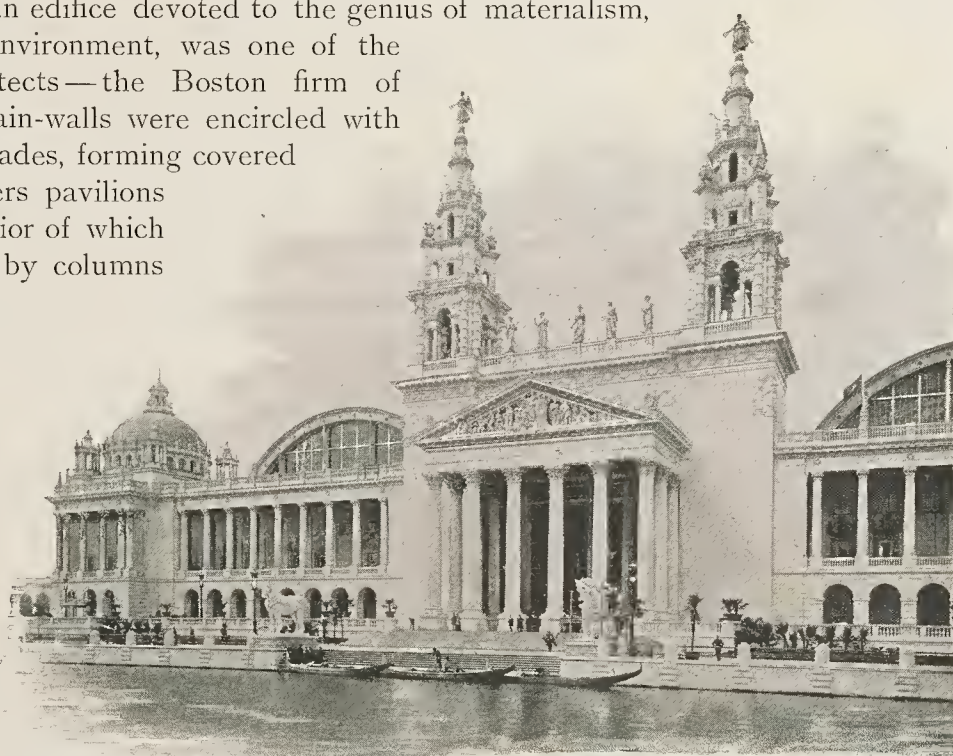
MACHINERY



SOUTH of the Administration building, fronting 350 feet on the main avenue, and with a depth of 500 feet, is the Palace of Mechanic Arts, or as it is more commonly termed Machinery hall, covering, with its annex, more than seventeen acres. While less than one third the size of the Manufactures building, this edifice, apart from its annex, has more than double the dimensions of the national capitol, or of the parliament houses at Westminster. The three main interior divisions resemble somewhat as many railroad sheds placed side by side, each with a conical roof 100 feet in height, supported by arched trusses 50 feet apart. Around this triple hall is a gallery 50 feet wide, and through its centre runs a transept, 130 feet in width. The internal arrangement is admirably suited to the purpose, with a structural design so simple as in a measure to dispel the sense of perplexity caused by a vast display of machinery in motion.

For a building intended for such purposes the foundations must be especially solid. To support the machinery the heaviest and most massive substructures were laid at brief intervals, each of the iron trusses that support the roof resting on huge wooden blocks placed cross-wise, bolted, and supported by poles. The entire edifice rests on a foundation of planking and trestle work, its frame being mainly of wood, while the trusses are of such width that, after serving the purpose for which they were fashioned, they may be used in the construction of railroad sheds.

How to give to this prosaic structure an exterior design in keeping with the remainder of the group that surrounds the great quadrangle, to impart to an edifice devoted to the genius of materialism, an air of beauty and harmony befitting its environment, was one of the many problems which confronted its architects—the Boston firm of Peabody and Stearns. First of all, the curtain-walls were encircled with two-storied porticos and with Corinthian colonnades, forming covered walks around the four sides. At the corners pavilions were formed, each 50 feet square, in the interior of which were placed large double stairways inclosed by columns supporting an interior dome. Above this is a large exterior dome, resting on a circular podium, and at its top a lantern. In the centre the main façades are broken by a plain wall surface, carried to a greater height, and finished with a level cornice. On either side of this surface are towers, also accessible by staircases, and above them turrets built in stories and of octagonal shape, each of the topmost stories being almost spiral in shape, and crowning a loftier monument than that on Bunker hill. Between the towers are intermediate pavilions, the one facing the main court



SECTION OF MACHINERY HALL



ENTRANCE MACHINERY BUILDING

containing a portico with semi-circular entrance way, of the Corinthian order, crowned with a low half-dome, and with a statue over each of the columns.

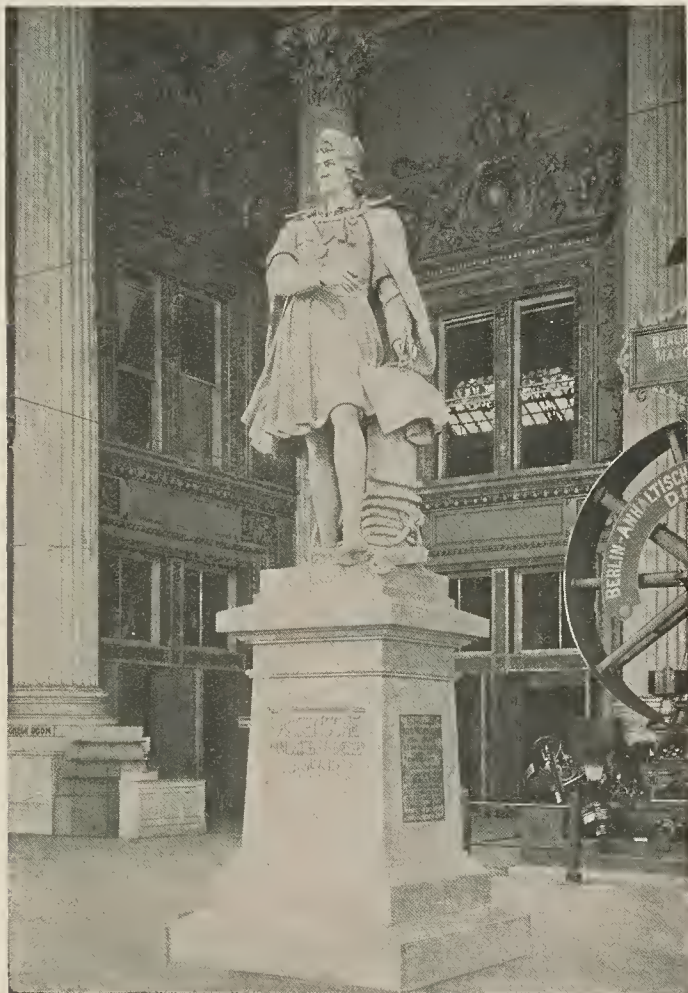
Says one of the artificers of the Fair, in commenting on the design: "The long level sky-lines of these great façades, thus broadly accentuated at the corners by domes, and in the centre by the aspiring lines of twin towers nearly 200 feet high, were devised to form an engrossing foreground to the long higher roofs of the triple naves behind, broken by masses of decorative skylights and by the three low conical roofs of the main central transept. On the shorter front these naves present their glazed circular ends behind and above the façade in the manner used in the great Roman baths. In this way every principal feature of the main structure is made to play a noble and expressive part in the decorative scheme. The details of this design have been kept in rigid conformity with classical and scholarly traditions, relieved in parts by motives suggested by the highly ornate renaissance of Spain. Enriched profusely with sculpture and emblematic statues, and with effects of decorative color behind the open screen of the porticos, this composition, if it does not succeed in revealing the mysterious relationships between machinery and art, may at least stand as a beautiful model of highly organized academic design devoted to modern uses."

Over the eastern doorway Columbia sits enthroned, in her right hand a sword, and in her left the olive branch of peace. Near her stands Honor, holding a laurel wreath, and from the steps of the throne Wealth is scattering flowers and fruits from a horn of plenty. On either side inventors and mechanics are submitting their work to judges selected from many nations. At the corners of the main pediment are lions, typical of brute force, subdued by two young children, symbolic of human genius. Above them is a group representing Science and the Four Elements, this being repeated over the northern entrance way, and beneath it, figures bearing escutcheons, on which are portraits of prominent inventors.

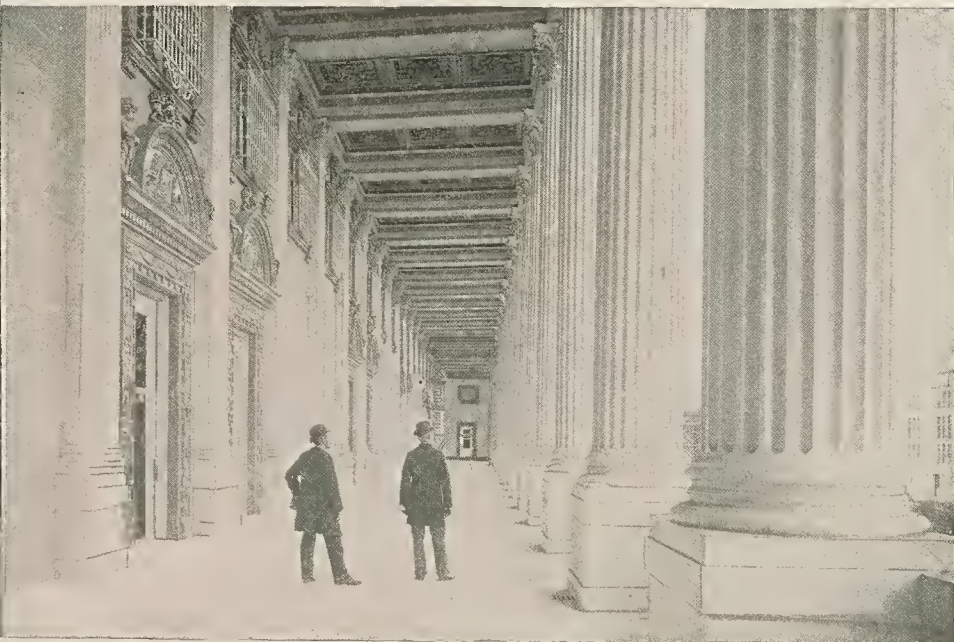
To the visitor whose tastes incline to mechanics the Machinery department is one of the most attractive features of the Exposition. That both as to size and quality the display is worthy of the occasion we have sufficient evidence in its many acres of exhibiting space, covered with specimens culled from old and new world centres of industry, the American manufacturer vying with the European, and each country striving to demonstrate that its artificers are among the foremost of their craft.



STATUARY ON THE COLONNADE



COLUMBUS STATUE, NORTH ENTRANCE



THE LOGGIA, MACHINERY HALL

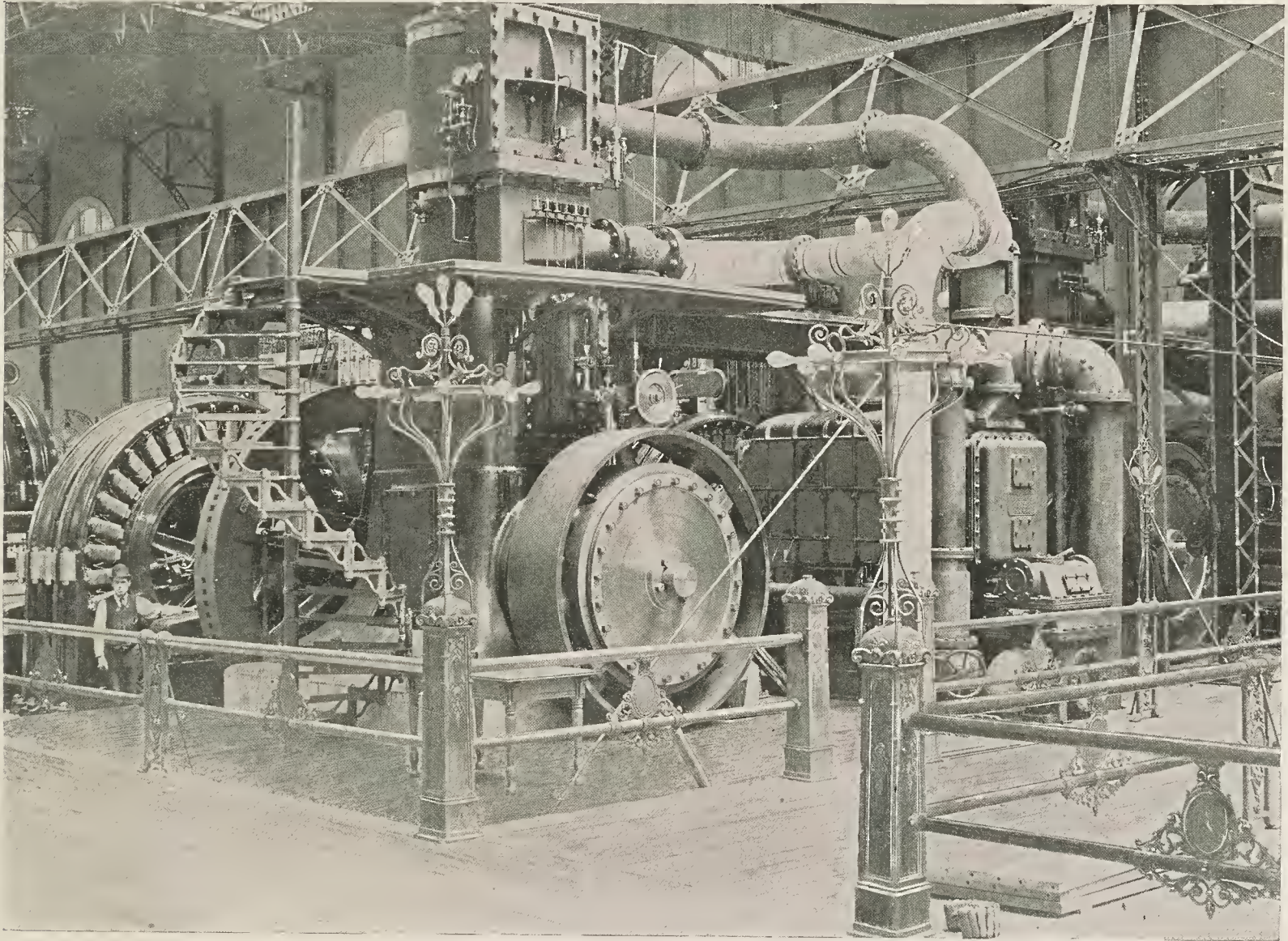


CENTRAL AISLE, MACHINERY HALL

In 79 groups and nearly 200 classes of exhibits is here represented almost every mechanical device fashioned by the ingenuity of man. There is machinery for the transmission of power, whether by electric, steam, hydraulic, or pneumatic apparatus; there are machinery and appliances for the manufacture of textile fabrics, for the preparation of various articles of food, for type-setting, printing, binding, stamping, embossing, and other branches of book and newspaper work; there are machines, apparatus, and tools for lithography, color printing, photo-mechanical and other mechanical processes of illustrating; for working metals, minerals, and woods. Finally there is a collection of fire engines and fire extinguishing appliances, whether by water or chemical apparatus, with machines and implements for many miscellaneous purposes, from shaping the head of a pin or the eye of a needle, to the construction of a watch.

In the sections occupied by the United States is a complete illustration of the inventive skill of her mechanics, who within the last half century have revolutionized many branches of industry, and created many new ones. In all these inventions the tendency has been to increase the quantity and improve the quality of products while dispensing as far as possible with manual labor, and rendering processes more and more automatic. Thus it is that the value of production per capita of the operatives employed has more than doubled within forty years, and even within the last decade shows a considerable addition. This has been accomplished not only without detriment, but with material benefit to the wage-worker, whose average earnings have increased more than forty per cent since 1850, and with a three or four-fold gain in the number employed.

Of the twenty or more branches of manufacture whose output exceeds \$10,000,000, by far the largest is that of iron and steel, the value of which, including the unwrought metal and the machinery and apparatus into which it is made or partly made, is probably not less than \$1,200,000,000. Of this amount perhaps \$400,000,000 represents the value of iron and steel, \$500,000,000 of machinery and manufactures, and the remainder that of railroad tracks, rolling stock, and agricultural and other implements and appliances constructed partially of steel or iron. Under the stimulus imparted by improved machinery, whereby many articles are produced at little more than in former years would have been the cost of the raw material, the total value of all manufactures has increased more than seven-fold within two-score of years, affording employment or support to about one-fourth of the entire population of the United States. Such is the good work that machinery has wrought, since, in the later colonial period, it ceased to be regarded as a special invention of the devil, since the days for instance when Thomas Barnard preached before a Boston society for the encouragement of



WESTINGHOUSE ENGINE

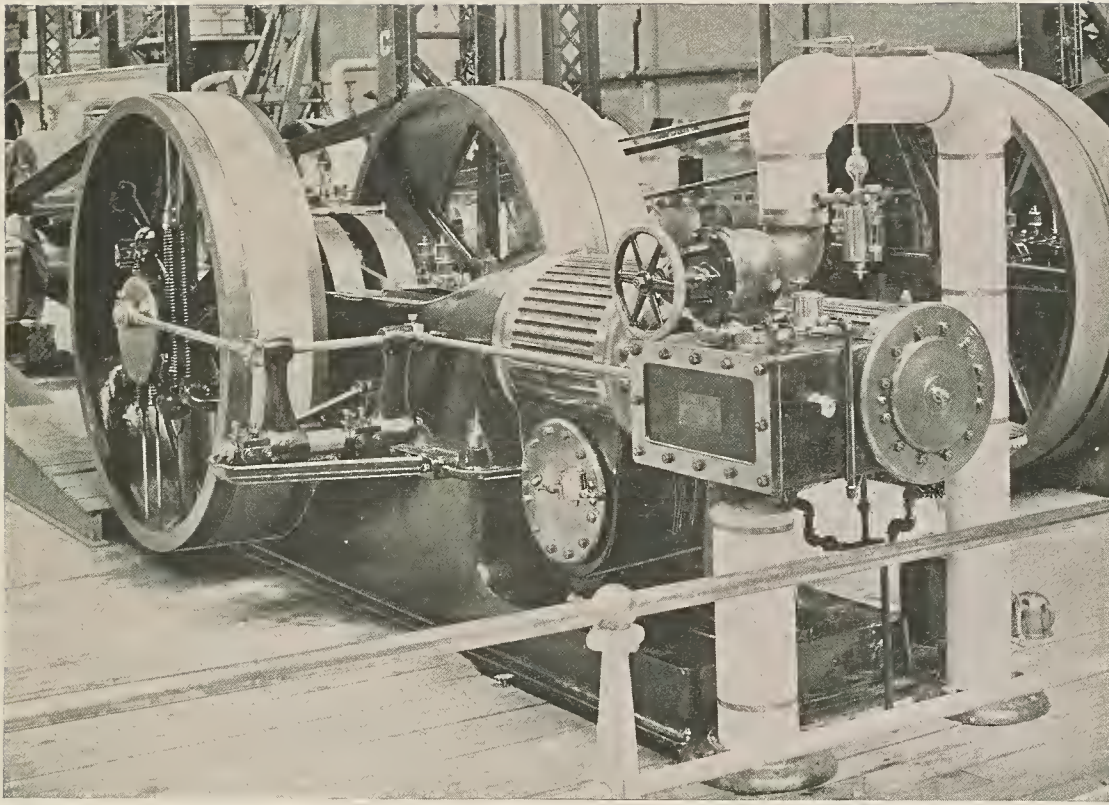
industry his "manufactory sermon," declaring that "an industrious prosecution of the arts of civil life was very friendly to virtue," and urging his people to make such progress in manufactures as would enable them to produce at home what they imported from foreign lands.

Along the southern walls of Machinery hall extend two corrugated iron structures, in which is generated most of the power whereby the buildings and grounds and the great fountain in the central court are supplied with electricity, the power that runs the Administration elevators, furnishes exhibitors with motive force, drives the sewage of the Fair toward the lake, and sets in motion some of the machinery in the hall itself. This primary power plant, known as the boiler-house, is adjacent to the main building, the smaller section, on the other side of the southern entrance way, being called the boiler-house extension. Adjoining these and contained within the main hall and its annex, are the 70 engines and 130 dynamos which complete the plant, one fully in keeping with the colossal proportions of the Exposition, and aptly termed the heart of the Fair. Of the 26,000 horse-power developed by its 54 boilers, fully two-thirds is transmitted to the engines and dynamos which generate electricity.

Passing along the galleries of the boiler-houses, on a level with the floor of Machinery hall, and a few feet above the line of great furnaces, the visitor may notice that the stokers are attired in neat white uniforms, very unlike the begrimed and grease-stained garments characteristic of the craft. This is explained by the use of oil as fuel, conveyed in the Standard company's pipes from Whiting, Indiana, some forty miles distant.



THE GREAT ALLIS-CORLISS ENGINE



TANDEM COMPOUND ENGINE

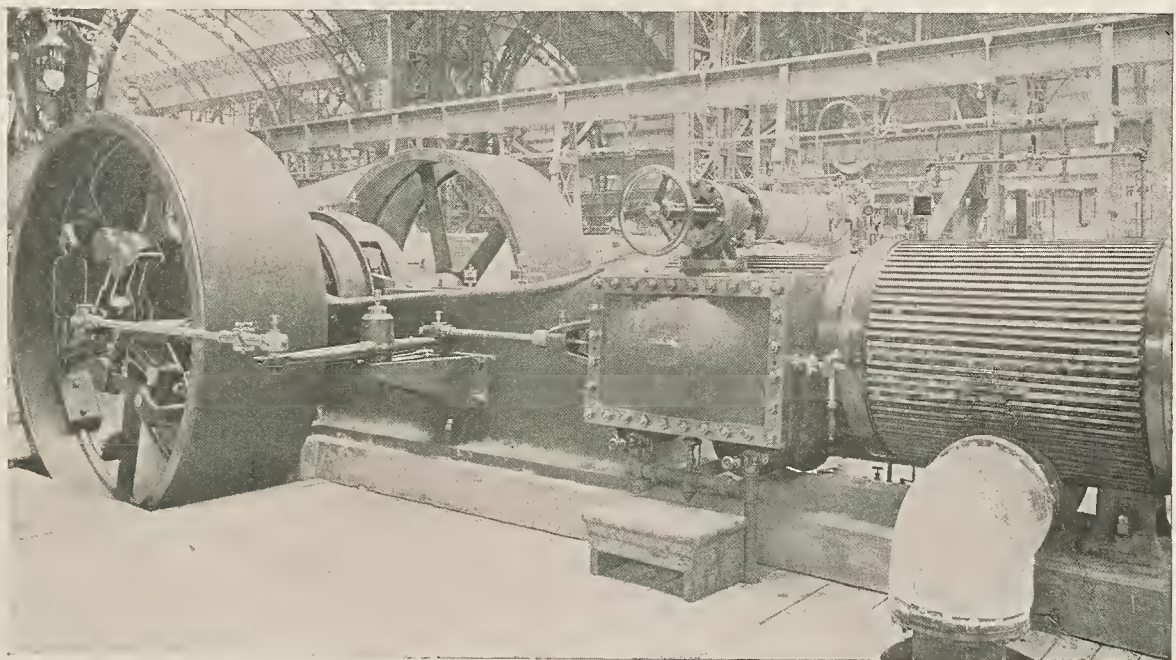
The oil is stored in iron tanks, enclosed in a massive brick vault in the south-eastern portion of the grounds, and with a total capacity of 112,000 gallons. This subterranean reservoir is in six compartments, each twice the size of the tanks, and thus is avoided or minimized the danger of explosion, should the grounds be swept by fire. Near by is the pump-house, from which, at a distance of more than half a mile, the oil is delivered, as needed, at the stand-pipe near the boiler-house. Each of the two pumps is furnished with a suction connection, by which, in case of accident at the boiler-house, the contents of the pipe may be returned to the storage tanks. The main lines of supply-pipes are enclosed in a heavy wooden

box, covered by removable cast iron plates, with branches leading to the boilers which furnish power for the several groups of engines, presently to be described.

The boilers are all of the water tube type, which in brief consists of a bank of tubes a few inches in diameter, and a dozen feet long, inclined upward, and connected with a large steam drum or reservoir. The tubes are expanded at either end, and the entire apparatus is filled with water up to about the middle of the drum. As the steam is generated by the flames beneath, it passes from each pair or battery of boilers into one common pipe, which delivers it in turn to the headers, or reservoirs, located under the gallery floor. The water is then drained from the headers, and returned to the boilers for further use by a separate system of pipes. To boilers of this pattern it is claimed that even an explosion causes but little damage, since the enormous power which they generate is distributed between eleven or twelve thousand tubes. After the plant was put in operation, several of the tubes were burst, and yet without serious injury.

The boilers are all operated on the same general principle, consuming about 12,000 gallons of oil an hour, and evaporating more than 100,000 gallons of water. Generated in these monster batteries, and emptied into the headers under the gallery, the steam is conveyed to the engines in Machinery hall.

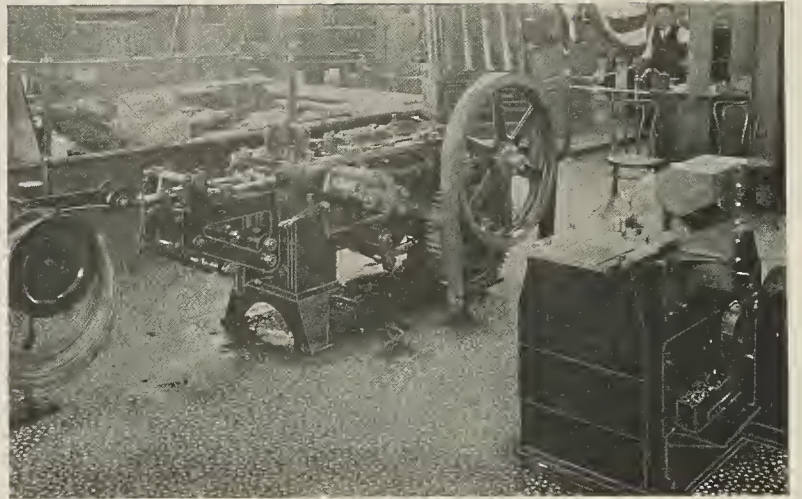
Arranged with reference to the uses for which they are intended, the group of electrical engines is by far the most remarkable. The largest in this class is the quadruple expansion condensing engine, exhibited by Allis and company, of Milwaukee, and used in the operation of two dynamos with an aggregate capacity of 20,000 incandescent lights. With perhaps one exception, the entire mechanism constitutes the largest single electric-light plant in the world, and there is no stationary engine of greater size in existence. The engine itself is of 2,000 horsepower, and as to its dimensions, it may here be stated that the fly-wheel is 30 feet in diameter, length of shaft 17 feet, diameter of largest cylinder nearly 6 feet, and that it occupies some 3,000 square feet of floor space. Near the railing which encloses it are two faded yellow documents, framed, and under cover. One of them is the original contract awarded in 1796 to the firm of Boulton and Watt for the



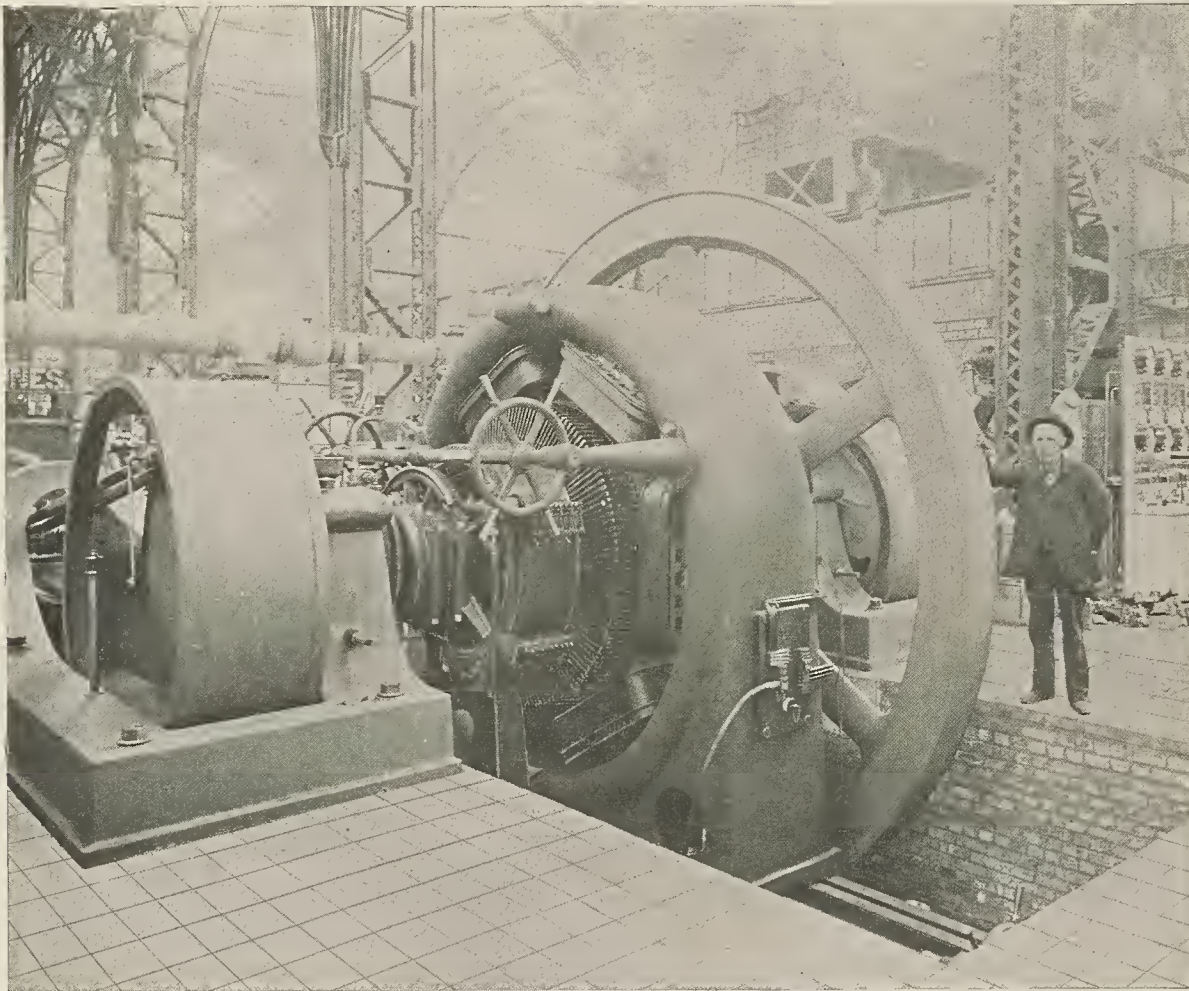
COMPOUND ENGINE

construction of a steam engine for the Birmingham Flour and Bread company, and attached to it is a schedule of some of the materials to be used.

The largest collection of engines in Machinery hall, or elsewhere in the Exposition, is that of the Westinghouse company, of New York, which alone has thirteen specimens of its workmanship, with an aggregate of more than 7,400 horse-power. It is worthy of note that among all the engine builders of the New England states, only two Rhode Island firms are represented, the middle and western states furnishing the bulk of the display. Among the more attractive exhibits is a small nickel-plated engine of Iowa manufacture, of cunning workmanship and perfect finish.



COLD FORGING PROCESS

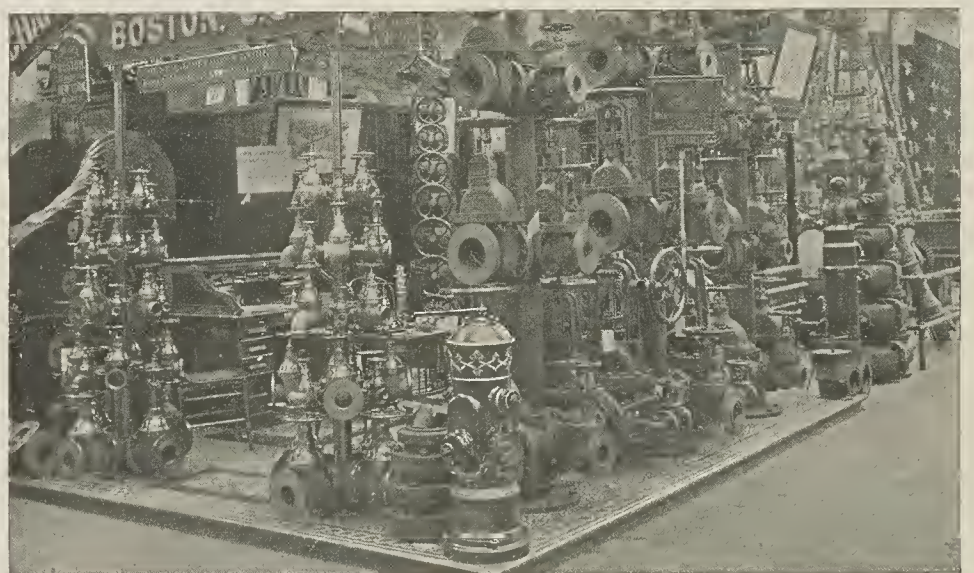


WESTINGHOUSE RAILWAY GENERATOR

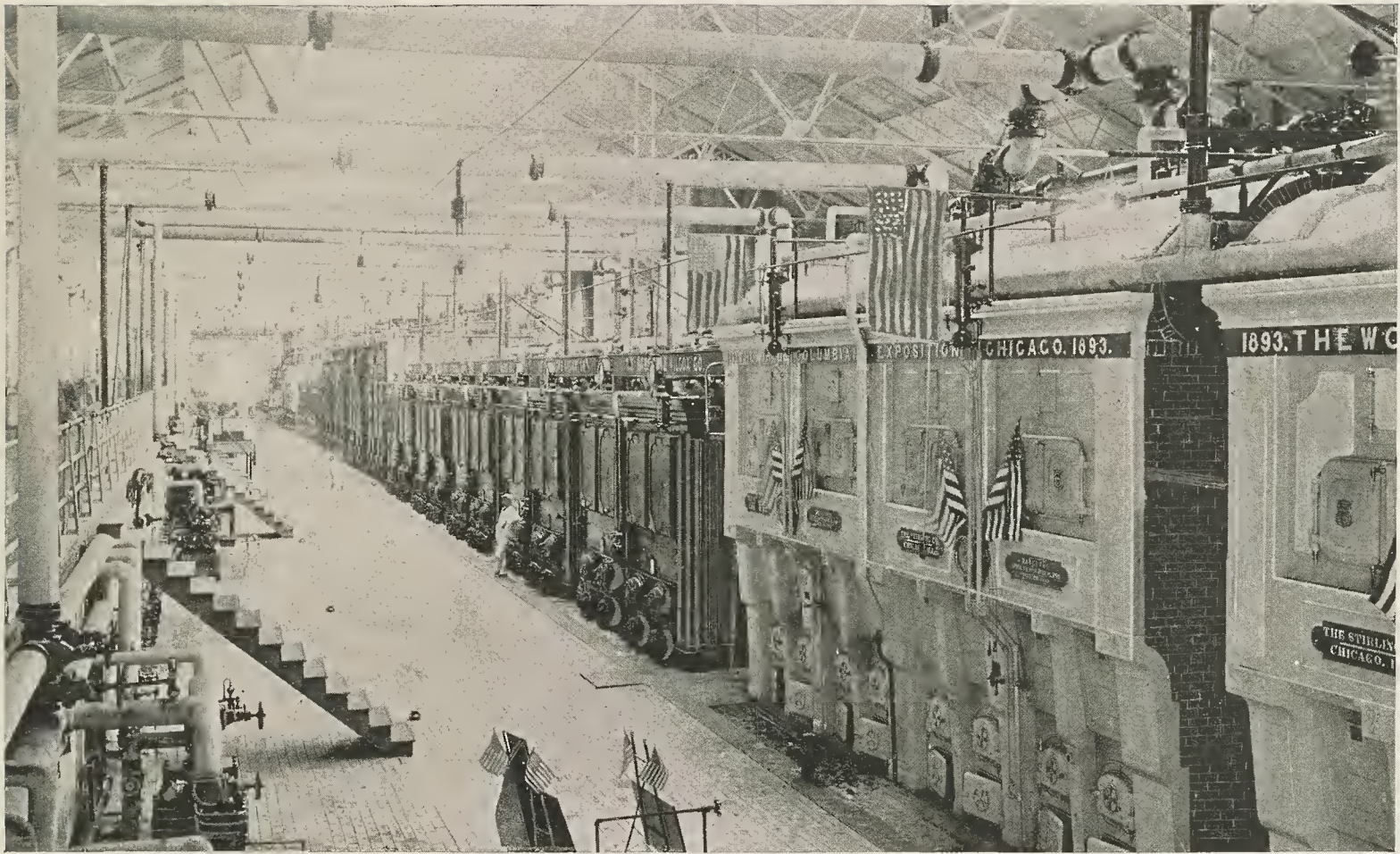
Compared with the engines which furnish electric power, and which, in turn, derive their motive force from the boiler plant, those that supply steam power or compressed air are of minor importance, the latter being mainly used by the elevators and certain of the locomotives in the Transportation building. Few of the mechanisms in motion within the hall derive their power from the regular plant, the main use of which is, as I have said, the generation of electricity, conveyed by underground wires to every portion of the grounds. Some fifteen engines, scattered through the building and acting independently of the power plant proper, drive six lines of iron shafts, each extending for a distance of 1200 feet, along the main structure

and its annex. By these shafts, revolving eighteen feet above the floor, power is furnished to exhibitors by merely throwing a belt over the one nearest to their allotted space. Engines of British and German make drive the machinery in their sections, and for the same purpose the United States division has several of home manufacture.

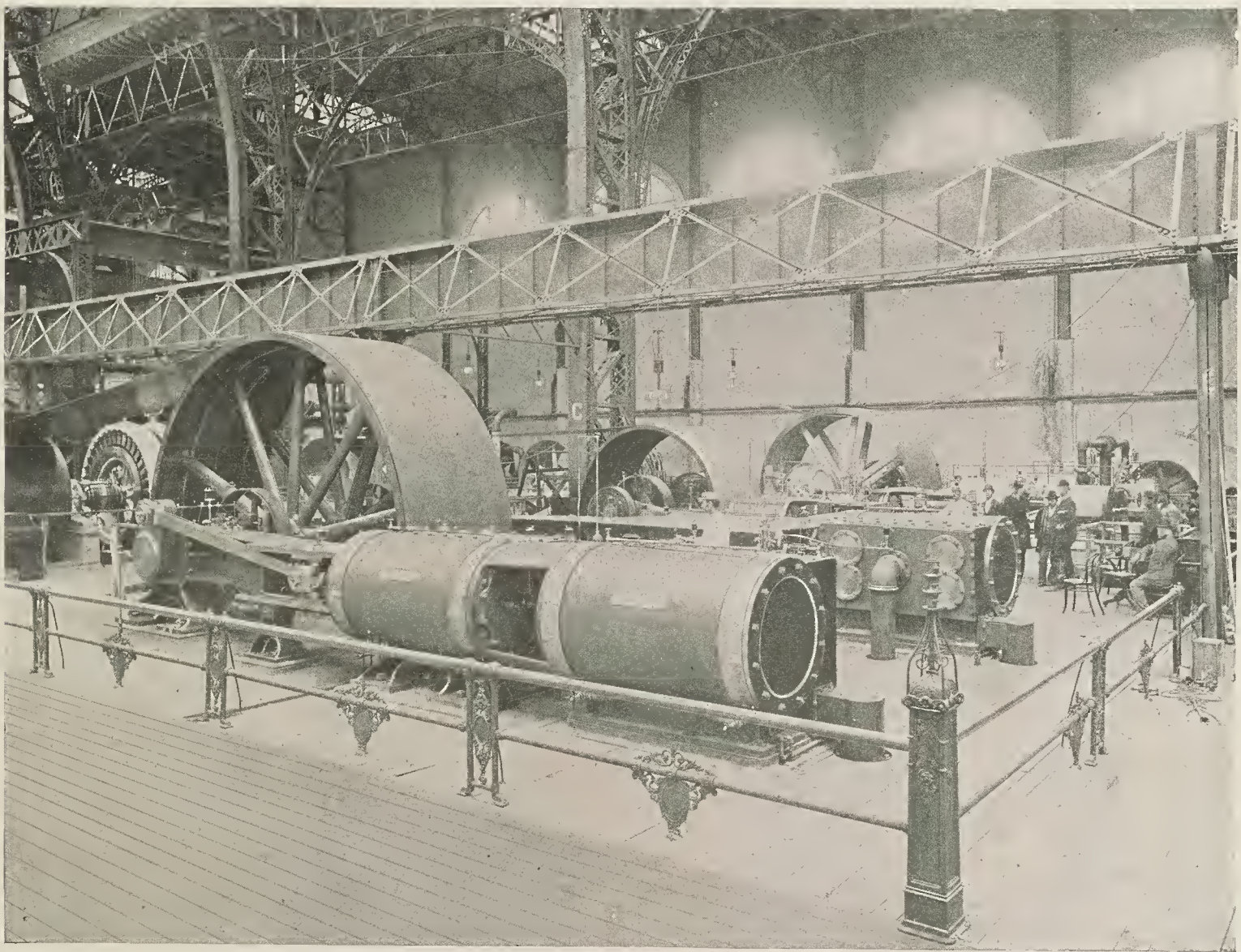
By several manufacturing companies are special exhibits of their appliances for the transmission of power, one firm using manilla rope, another, cow-hide, and a third, a stout duck fabric, in place of leather belting. But on all sides is the regulation shafting and belting, a New Hampshire company producing what is claimed to be the largest belt in the world,



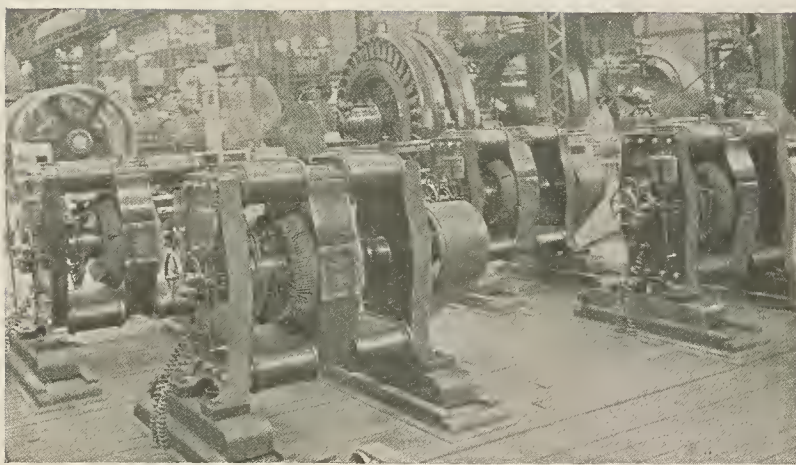
VALVES AND PIPES



LARGEST BOILER HOUSE IN THE WORLD



BUCKEYE ENGINE COMPANY



WOOD'S DYNAMOS

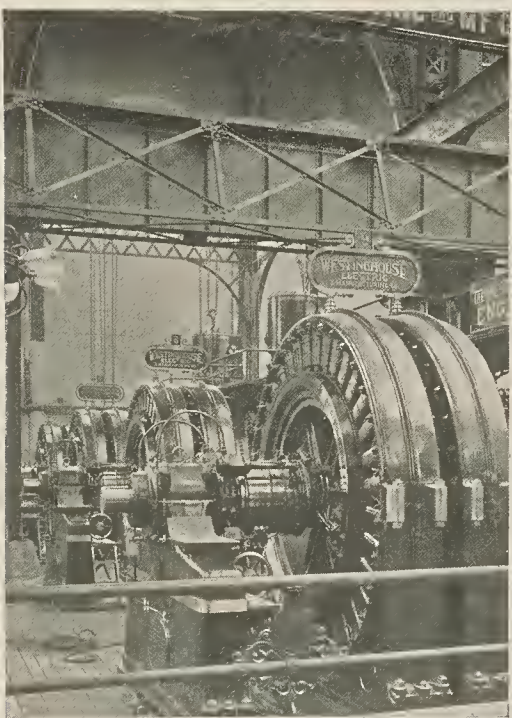
more than 200 feet long, by eight and a half in width. It is fashioned in three-ply, oak-tanned, weighs 5,176 pounds, and in its construction there were used 569 hides.

Hoisting engines of all descriptions are classed with motors and apparatus for the transmission of power. Perhaps the most remarkable of this group are the travelling cranes, operated by electricity, three of them in Machinery hall, and one in the machine-shop south of the annex. The latter can haul a weight of from ten to fourteen tons, swing its load aloft, and raise or lower it, all without jar, and with scarcely a tremor. Its motions are readily guided by a single workman, or even by an intelligent boy. The other cranes are of mammoth proportions, as in truth they must be, for during the installation process they placed in position all the more massive machinery. Their present use is to carry passengers to and fro, for which purpose they are suitably equipped. Each of them has a span of 75 feet, the tracks being laid on plate girders, and supported by steel columns about twenty feet high. The supporting structures are designed for a load of more than forty tons for each end of the crane, which travels at the rate of some 300 feet a minute. At the western end of the annex is a balcony, reached by several elevators, the latter forming of themselves an exhibit by the Crane company.

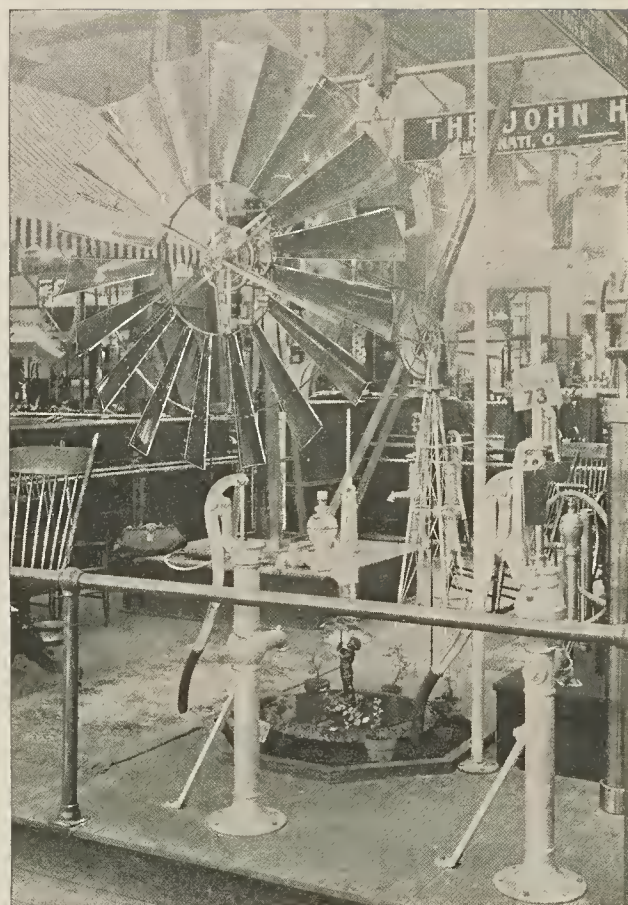
In the line of hoisting machines the United States has the only display. Some of the engines are especially used in building, the cranks being so constructed that a heavy load can be raised or lowered with remarkable smoothness and rapidity. Others, designed for bridge construction, are so fashioned that all friction may be avoided. Quarrymen may also inspect the engines or models best adapted for their work, some of them having masts and booms by which a weight of ten or twelve tons may be readily lifted and moved in a straight or circular line. Many of them are worked by electricity, and are controlled at will by a single engineer, herein being a forcible illustration of progress in the invention of labor-saving machinery.

The exhibit of pumping engines, also included in this class, is grouped around a basin of cement filled

with water, and placed at the junction of the main hall and its annex. There are about fifty exhibitors, by whom are shown all kinds of machines, single, duplex, horizontal, and vertical, iron and wooden pumps, hand pumps and those operated by compressed air and steam, pumps for the farm-yard and others adapted to artesian wells. To demonstrate their several qualities the exhibitors depend upon the central reservoir, from which are drawn and returned its contents according to the power with which the pumps are supplied. One powerful force pump discharges into a large wooden trough; others send columns or sprays of water into the tank, and a Cincinnati firm has erected a shapely fountain, around which its air compressors and steam pumps smoothly perform their offices. An Illinois company displays an aerating pump which forces air to the bottom of a cistern, thus



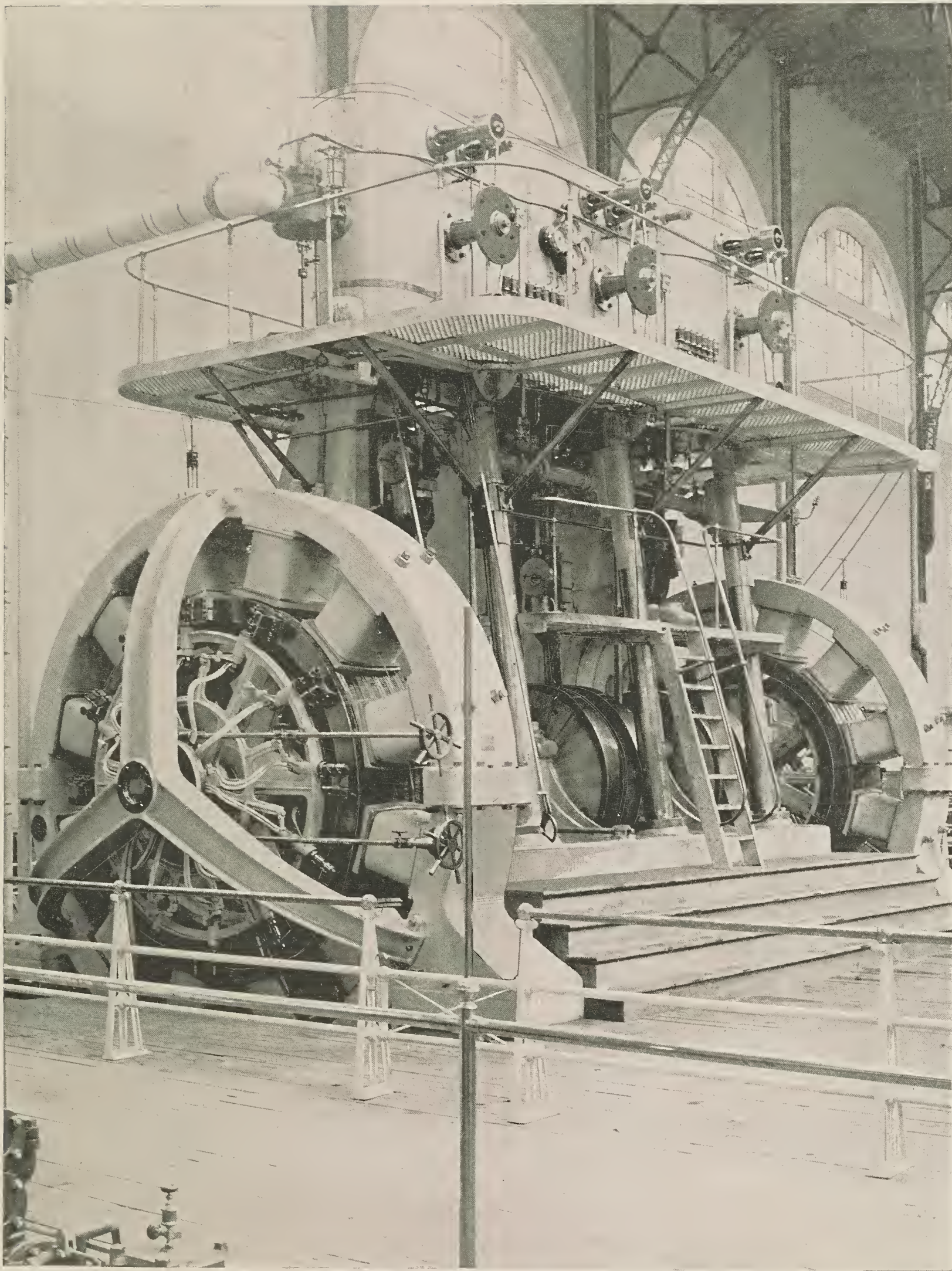
WESTINGHOUSE DYNAMO



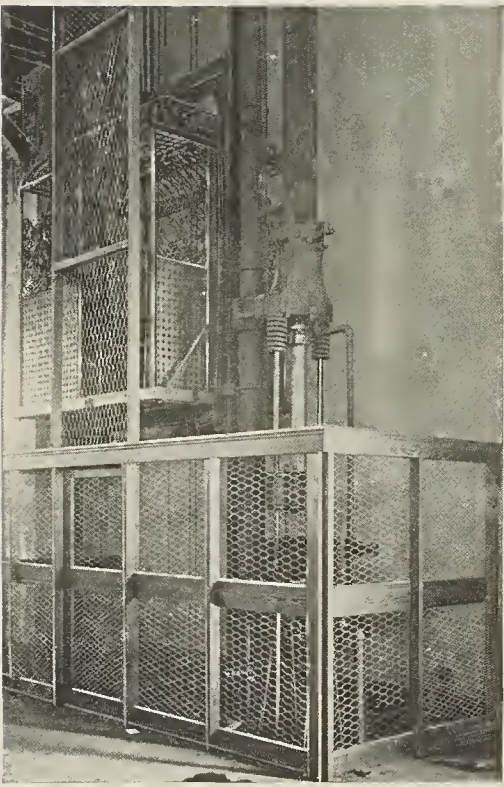
COPPER WIND MILL



TWIST DRILL EXHIBIT



EDISON ENGINE AND DYNAMO



CRANE ELEVATOR

nection with the Waukesha Hygeia New Orleans factory; but within machine of a New York firm, with

In the annex, west of the power plant, is a small collection. The only display of large fire Falls, New York; but several Chicago chemical apparatus, and hand group consists of hose, nozzles, of fire-escapes, among the last of contrivances is a cage moving on an upright, the crank that propels below. Most of the exhibiting firms their apparatus in the fire stations and at the fire above referred to

The largest of the miscellaneous western portion of the annex, overflowing thence into the model machine-shop south of it. The latter was furnished entirely by a New York and Chicago company, for the purpose of displaying the specialties of manufacturers for whom they are agents. Here also the several firms with which the company has dealings exhibit specialties of their own, as forgings from iron, steel, copper, and bronze, lathes, vises, planers, drills, and punching and shearing devices. One of the exhibiting companies has a contract with the government for furnishing the army and navy departments with more than \$1,000,000 worth of turning, boring, and rifling lathes.

Beyond the machine-shop, and in the body of the hall, is an extension of this exhibit, where not only machinists, but steam fitters, blacksmiths, and tinsmiths may examine the most improved appliances of their trades, and at times may see them handled by skilful craftsmen. Included in this collection are riveting machines, shears for cutting sheet metal, hydraulic forging presses, power hammers, milling machines, portable forges, drills, planers, pneumatic pressing machines, and special machinery for making car pins and wheels, and the various parts of locomotives, marine boilers, and metallic bridges. A Trenton factory has its own brand of anvils and vises, and claims to be the oldest establishment of the kind in the United States. From the mint at Philadelphia comes

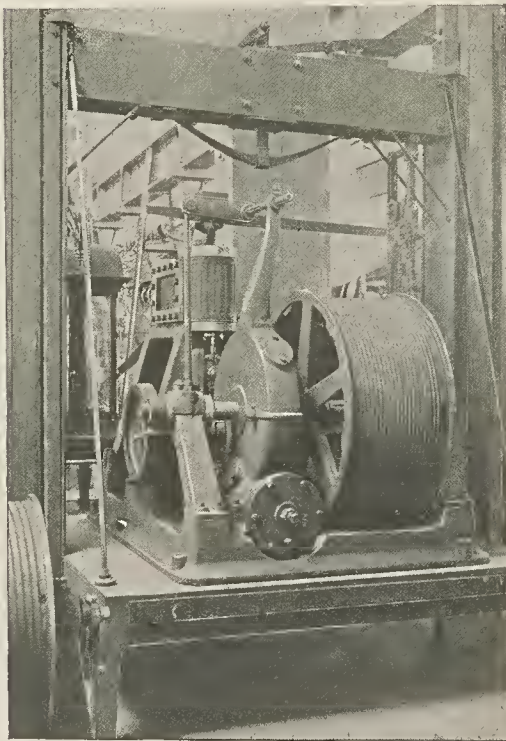
purifying the water; and a Pennsylvania establishment has on exhibition a steam-pump that will raise water from a depth of 500 feet, designed for the use of factories, mines, and irrigating systems. Of windmills there is only a single specimen; but there is a special out-door exhibit of windmills in connection with the Agricultural department, and especially of such as are used for farming purposes.

Adjacent to this section are the soda-water apparatus, apparatus for drawing beer, and for bottling and corking. By one firm is displayed its methods of carbonizing soda and mineral waters, champagne and other wines, and by another a machine for washing and rinsing beer bottles in one operation. Among the miscellaneous articles included in this group are iron and other metallic pipes, tubes, and fittings, stop valves, cocks, and such accessories for transmitting power. Under the heading of hydraulic and pneumatic apparatus is diving and refrigerating machinery. In the United States section there is no general exhibit of diving apparatus; but in the Midway plaisance experiments are shown in deep sea diving, illustrating the uses of modern appliances, including the workings of the sub-marine bell telephone. The largest exhibit of refrigerating apparatus and machines for making ice was installed outside the building, in the Cold Storage plant, elsewhere described in this chapter,

together with its destruction by fire.

In separate structures also are the exhibits of a Chicago firm in con-mineral springs company, and of a the hall is the 150 ton refrigerating double acting compressor.

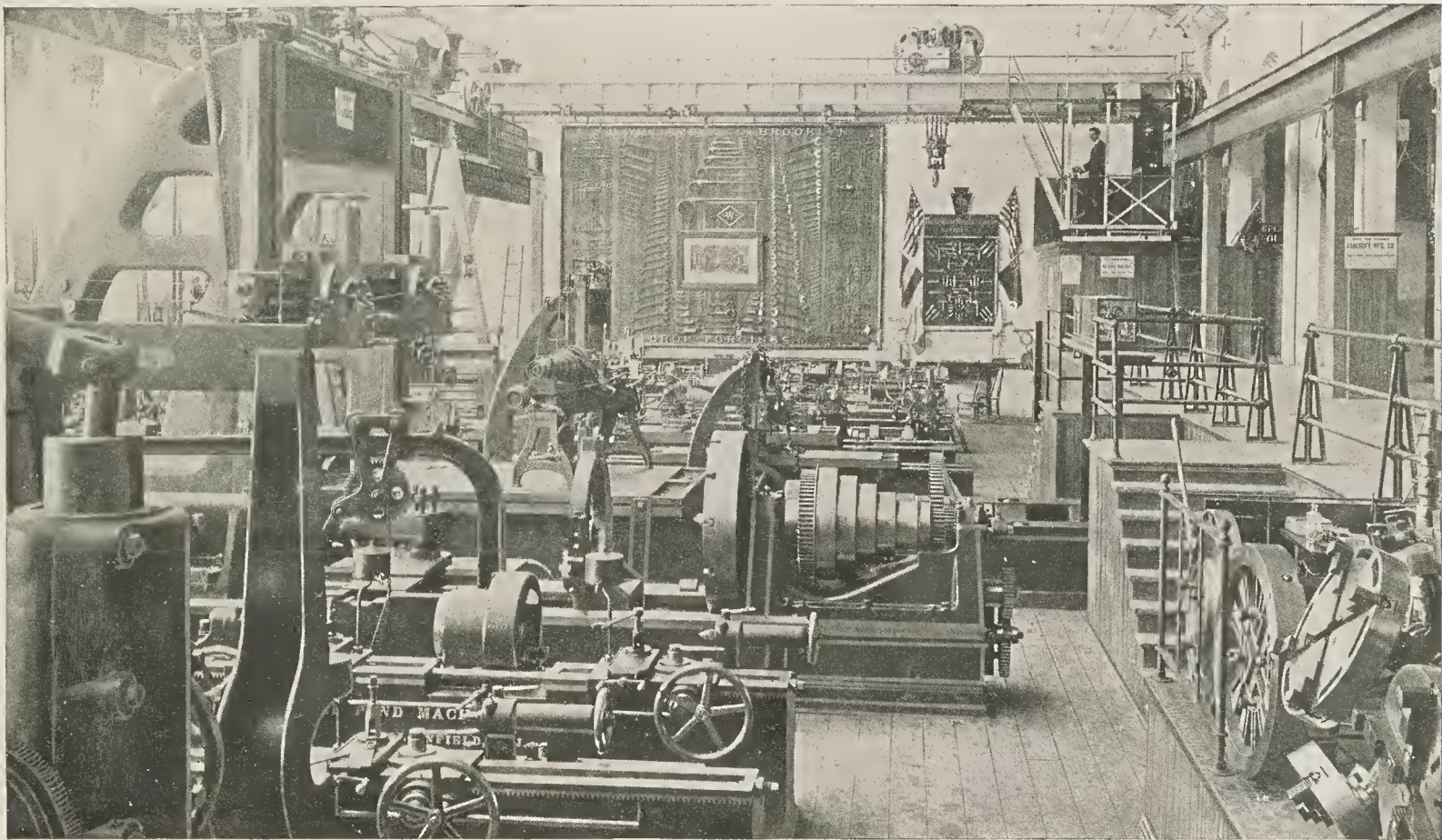
engines which form a portion of the of apparatus for extinguishing fires. engines is by a company at Seneca houses show the latest inventions in grenades. The remainder of the couplings, water towers, and models which one of the most practicable an inclined ladder, supported by the escape being wound by operators in this department have installed distributed throughout the grounds, many of them were put to the test. laneous exhibits is contained in the



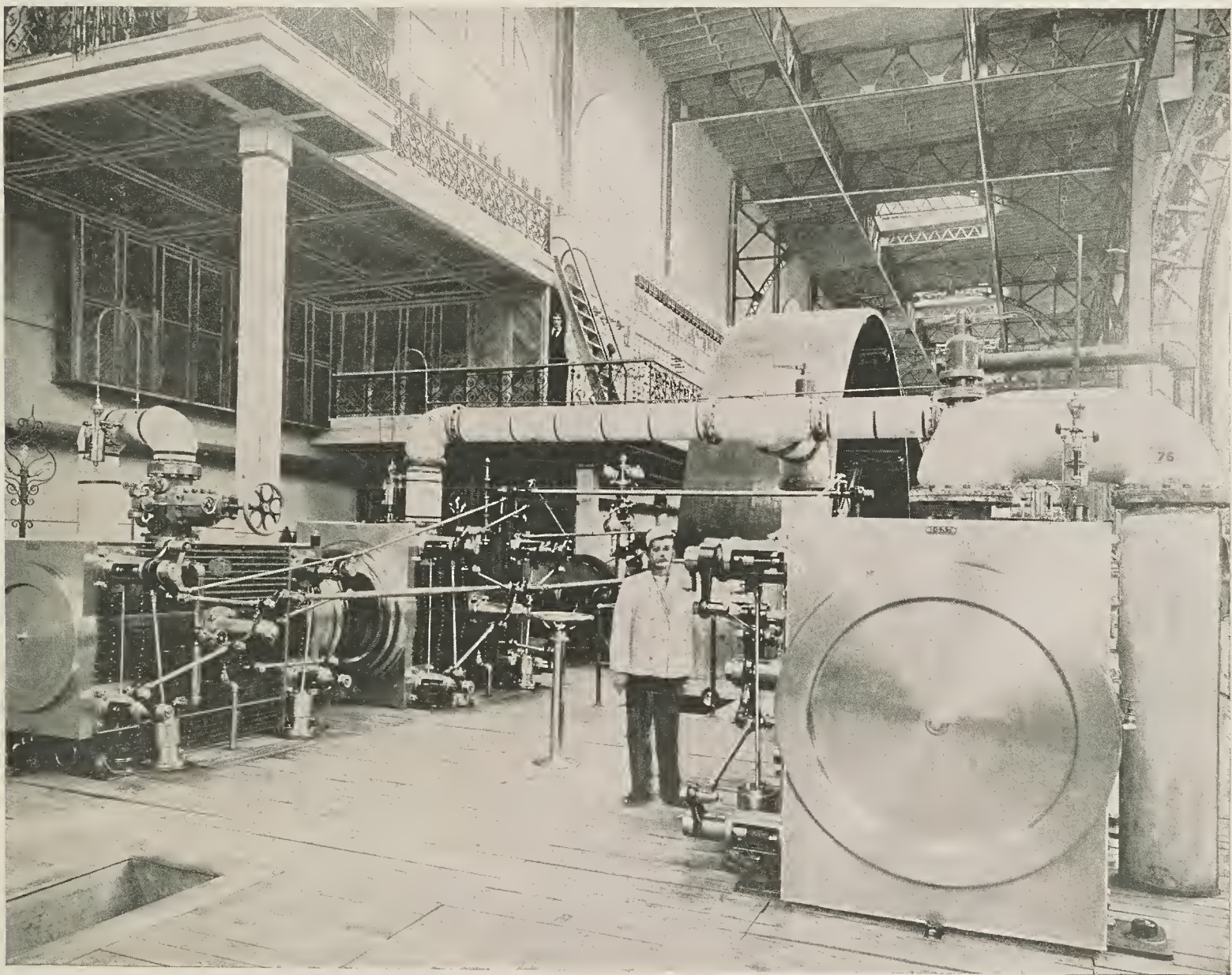
HYDRAULIC ELEVATORS



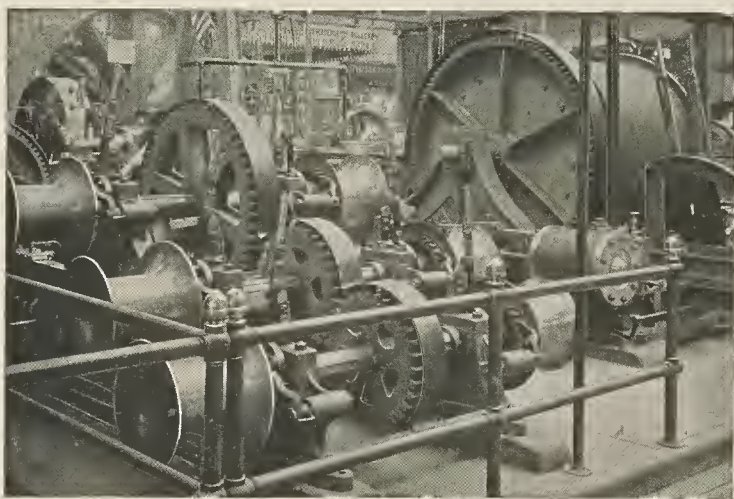
THE LARGEST BELT IN THE WORLD



MODEL MACHINE-SHOP



TRIPLE EXPANSION ENGINE

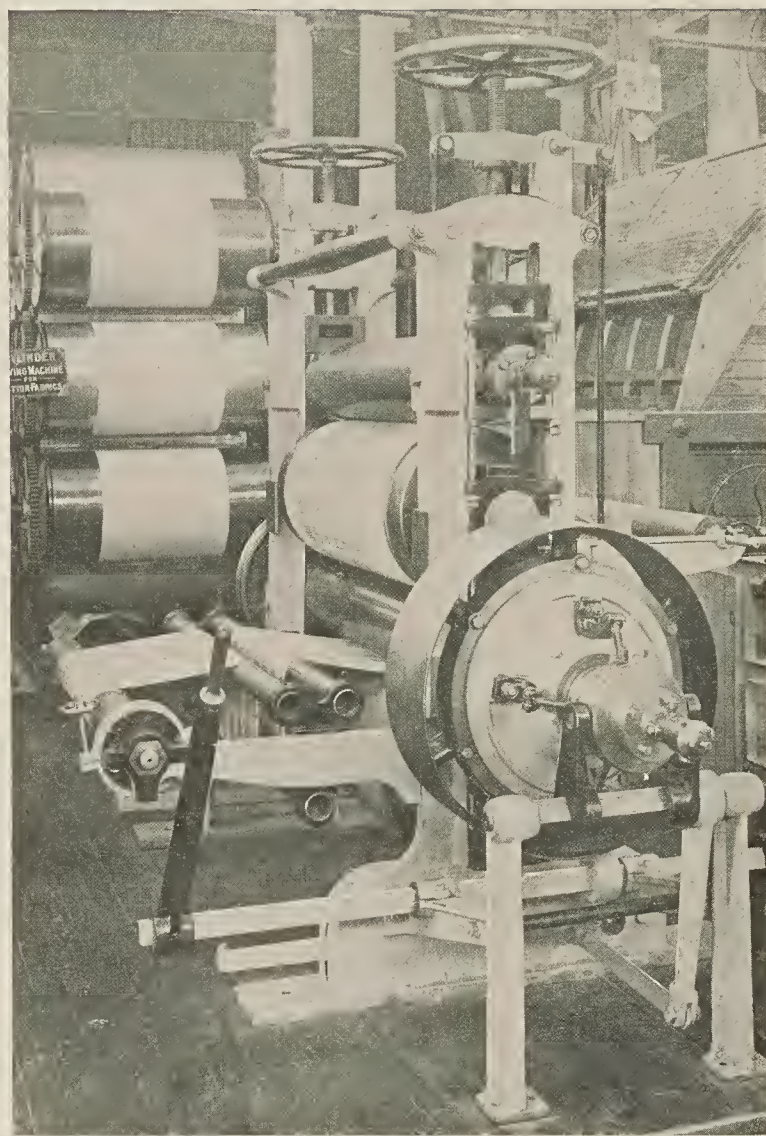


HOISTING ENGINES

the first steam coining-press used by the government, and among other interesting exhibits are machines which transform solid bars of steel into wire netting for gallery fences and for use as substitutes for lathing, with such as make hooks and eyes, chains, and steel fence posts.

Of machinery for the manufacture of textile fabrics and clothing, there are more than 70 exhibits in the north-western section of Machinery hall. In the former class are included not only apparatus for the production of silks, cottons, linens, and woollens, for carpets, tapestries, laces, and embroideries, for ropes and twines, and other fibrous products, but such as is used for the making of paper, felt, and rubber goods, and for the preparation and working of leather. Here may be studied the various stages of textile manufacture in all its branches, and especially in the operation of the looms, not only by way of illustration, but in the production of goods to order, forming an attractive and realistic working display. Silks, for instance, of intricate figures, are fashioned before the eyes of the observer by processes in which are still retained, though with many improvements, the principles evolved by Joseph Marie Jacquard, whose invention brought on him first the maledictions, and then the homage of Lyons silk-weavers.

Very noticeable are the improvements made in looms of the Jacquard pattern, even within the last



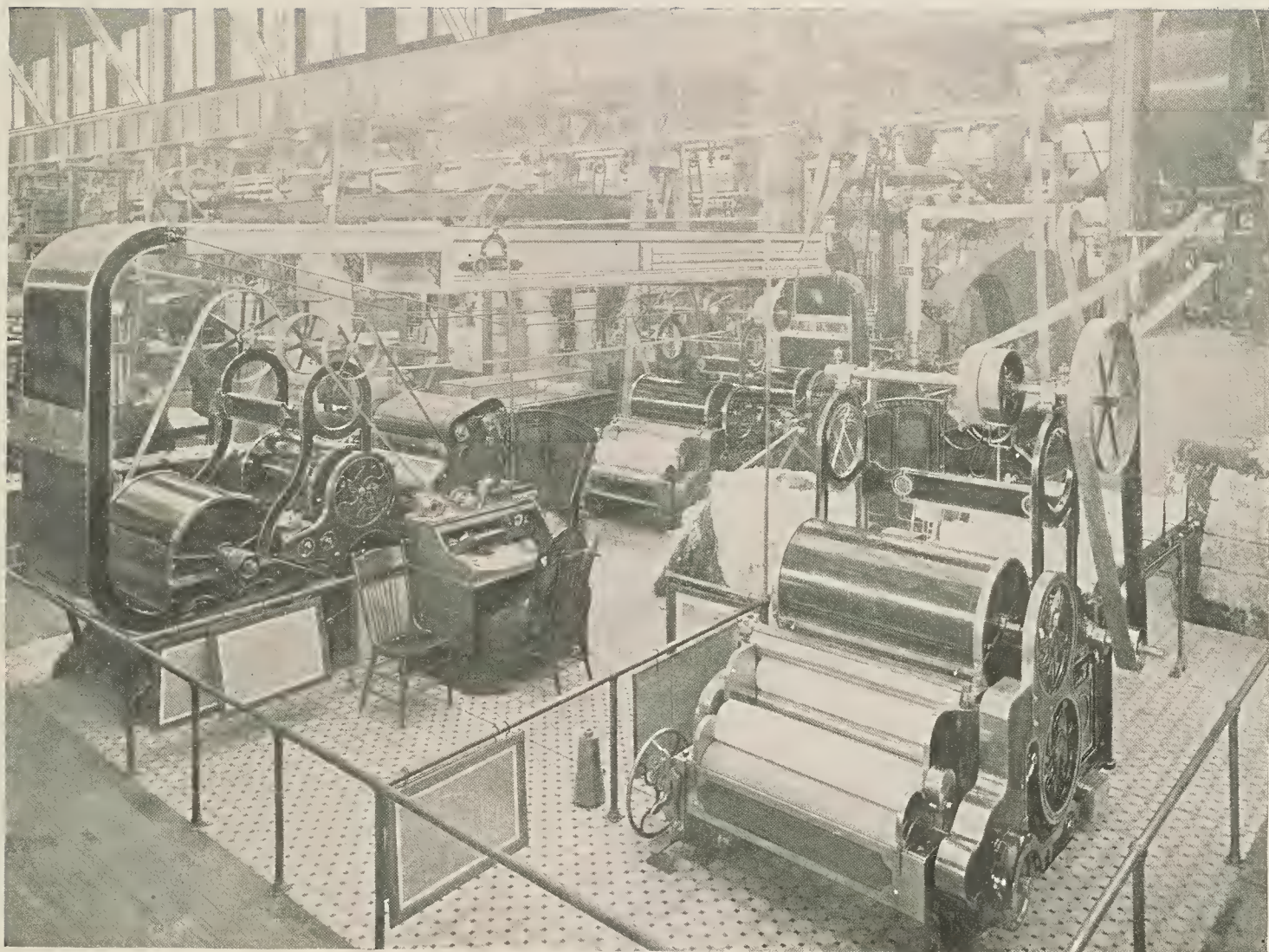
COTTON CALENDERING AND DRYING MACHINE



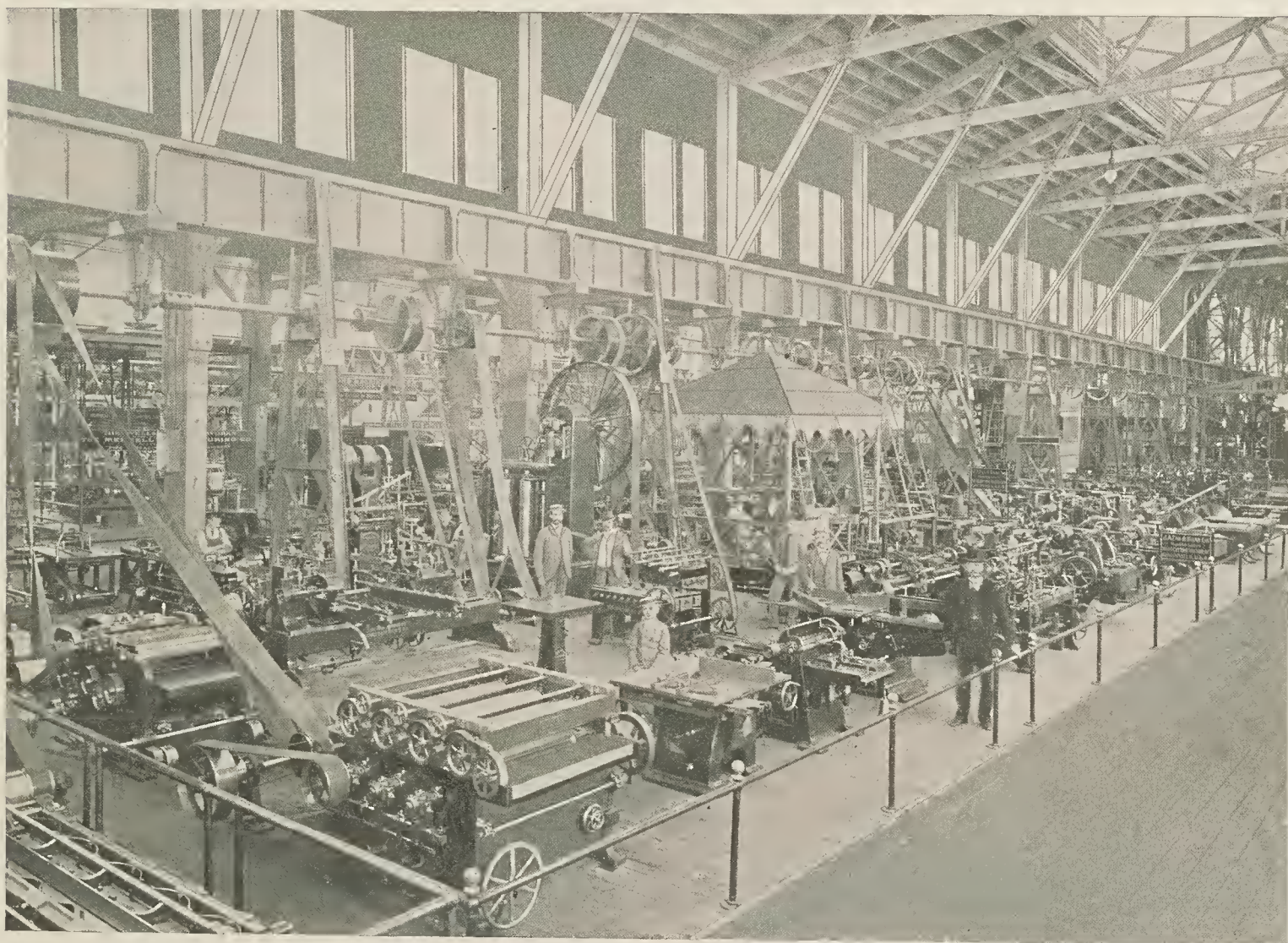
MORGAN ELECTRIC TRAVELING CRANE

decade. Among visitors to the Fair are those who still remember the first of these looms exhibited in Chicago, not many years ago, at a local exposition held on the lake front. Though a huge and cumbersome piece of mechanism, it performed many wonderful feats, or such they seemed to the throngs that gathered around it, producing, for instance, exposition badges and portraits of General Grant, all of them woven in silk. In contrast with it are those of modern make, as displayed in this department, with countless strings of perforated cards, set in motion at every throw

of the shuttle, each perforation representing one or more threads in the woof. Such looms are used mainly for the more intricate designs, and not alone for silk-weaving, but for the weaving of carpets, and other textile fabrics. By the largest among this group are woven bordered carpets twelve feet square, and at the smallest



COTTON MACHINERY



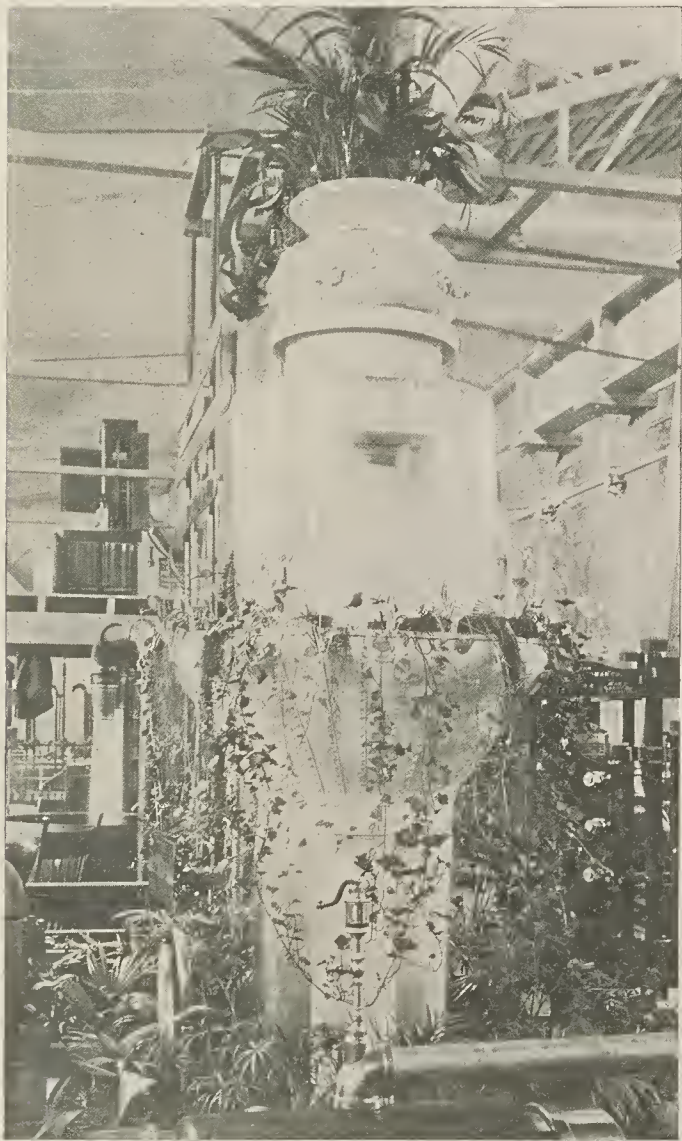
WOOD CUTTING MACHINERY



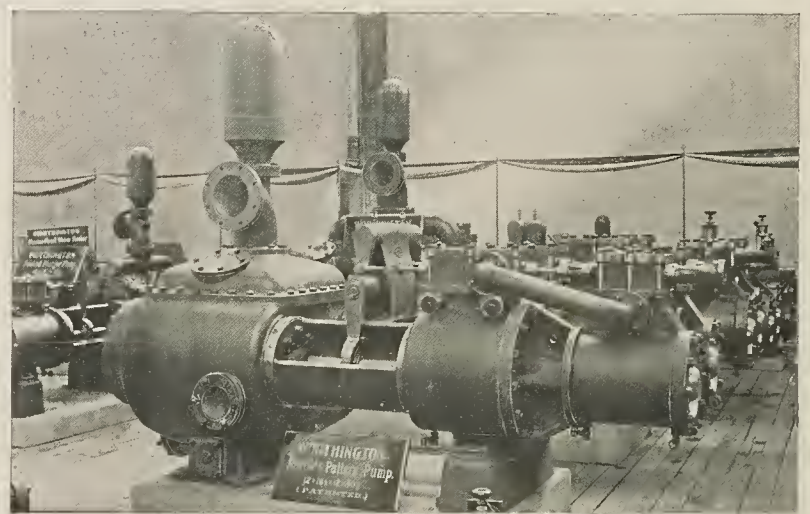
FOUNTAINS, PUMPING ENGINE EXHIBIT

of antique pattern, and fashioned entirely of wood, sits an aged man from a Philadelphia factory, moving the treadle by foot, and the shuttles by hand. With the exception of one for making Turkish towels, this is the only hand-loom in the collection. At the former a Turk, in orthodox native costume, bends over his task, and with true oriental deliberation swings forward his beam, and passes his shuttle through the warp. Next to him, by way of contrast, a modern Jacquard weaves a couple of towels at a time.

Of machinery for the production of silk goods there are several exhibits, some of them including looms for the manufacture of cottons, woolens, and mixed or miscellaneous textiles. Among the more interesting collections are those from Worcester, Massachusetts, one of its exhibiting firms stating that 10,000 of its looms are at work in foreign lands. A Philadelphia house has a large display of apparatus; Pittsburg and Paterson are also represented, and there is a single machine from the quaint old Connecticut seaport of Stonington, founded on Long Island sound in 1649, and where still are traces of its bombardment by a British squadron during the war of 1812.



WATER FILTER



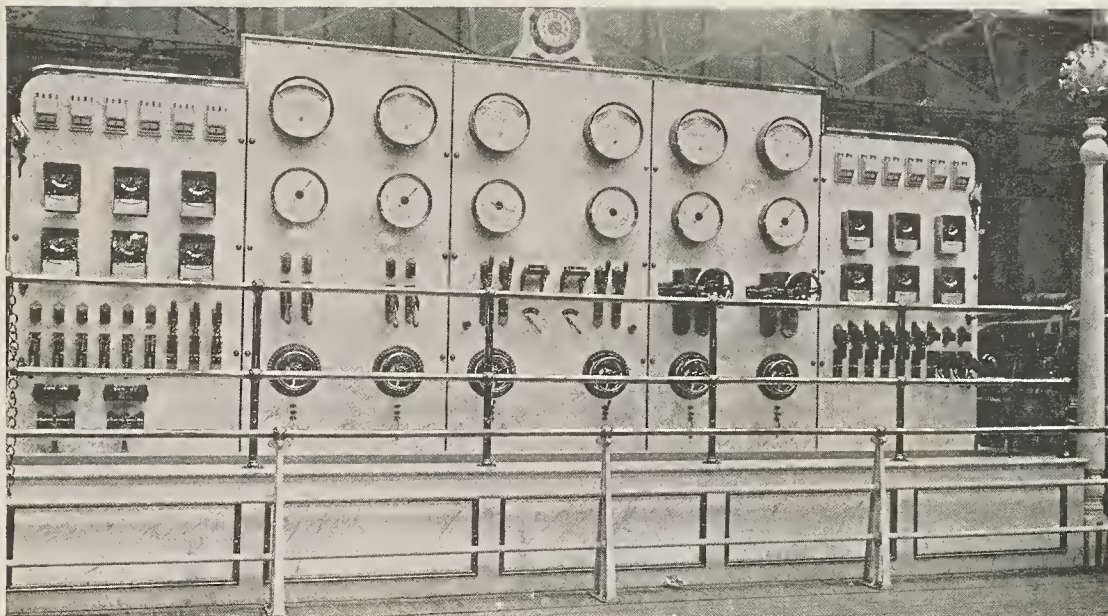
WORTHINGTON STEAM PUMPS

To describe all the workings of these looms is no part of my purpose, even were such description practicable; nor would days and weeks of close observation and study unfold to the visitor their manifold intricacies. Swiftly and smoothly they run, while producing the most elaborate as well as the most simple patterns, stopping when they should, and indicating by noisy demonstration when something is amiss, so that the operator would almost seem to be controlled by his loom, and not the loom by its operator. From the upper portion of the machine a mass of film-like threads passes down-

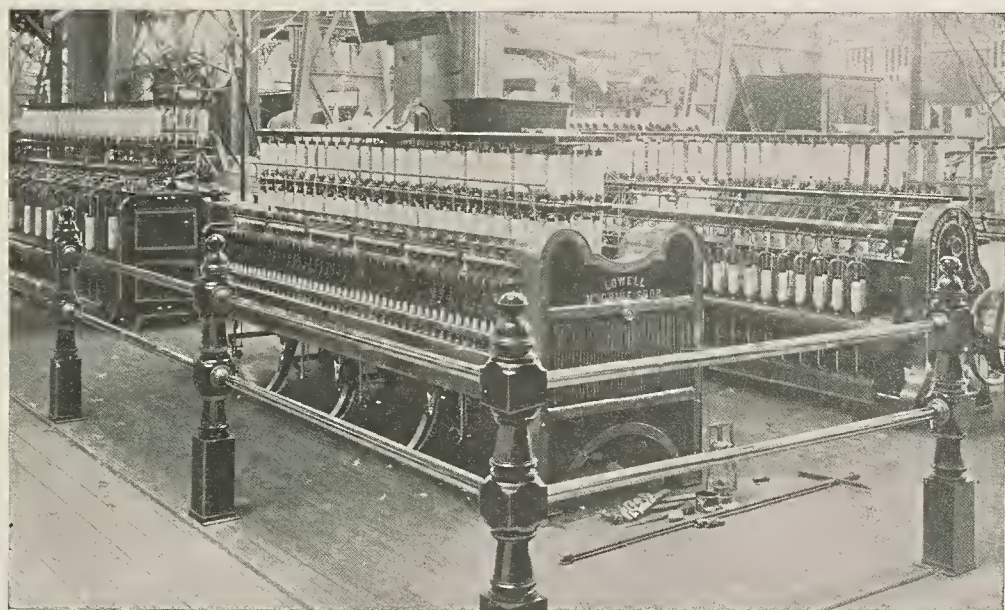
ward in unbroken line, mingling with the warp in complicated and mysterious fashion, while darting alternately, from left to right and from right to left, the shuttles perform their noisy task. As an instance of their rapidity of movement, it may be stated that, in the manufacture of towels of the finer grades, the shuttles pass to and fro more than 100 times over every square inch of their surface, and yet of such towels several hundreds a day can be made by half a dozen looms, with the aid of a single operator.

"My days are swifter than a weaver's shuttle," exclaimed the afflicted patriarch; but Job had never seen in motion a modern Jacquard loom.

Silk ribbons are made at the rate of two dozen pieces at a time, and passing from the loom as finished fabrics are wound into rolls by apparatus placed



SWITCH-BOARD



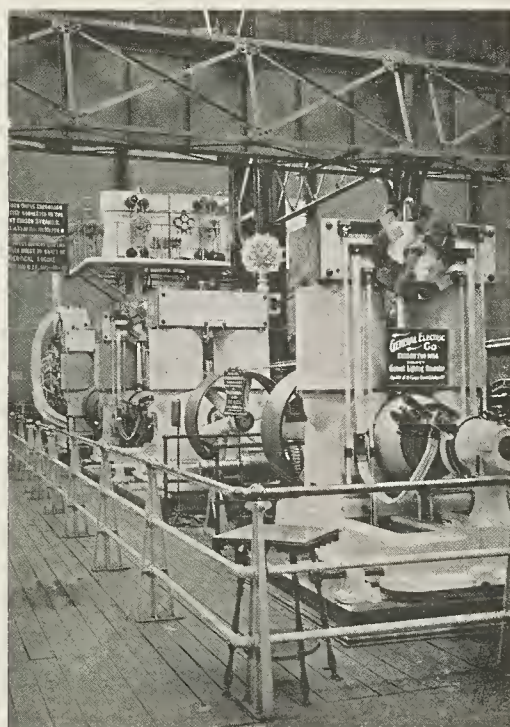
LOWELL COTTON MACHINERY

beneath. These are of many patterns, colors, and qualities, the warp displaying all the hues of the rainbow as the threads pass swiftly across the frame. The silk machines are worked by women, all of whom appear to be expert operatives, passing rapidly to and fro, correcting faults and

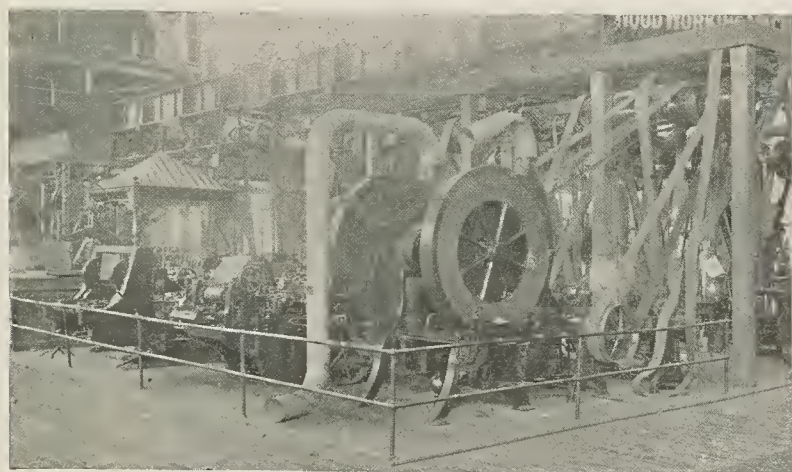
imperfections, stopping the loom when needed by simply moving a bar at its lower end, and setting again in motion its endless array of threads.

In addition to dress silks and ribbons, some of the former in heavy brocades, and the latter with satin finish, souvenir badges, and figured and embroidered handkerchiefs are manufactured by the dozen, with other articles classed under the head of art-weaving.

By the three Worcester firms mentioned as among makers of silk machinery, cotton and woolen



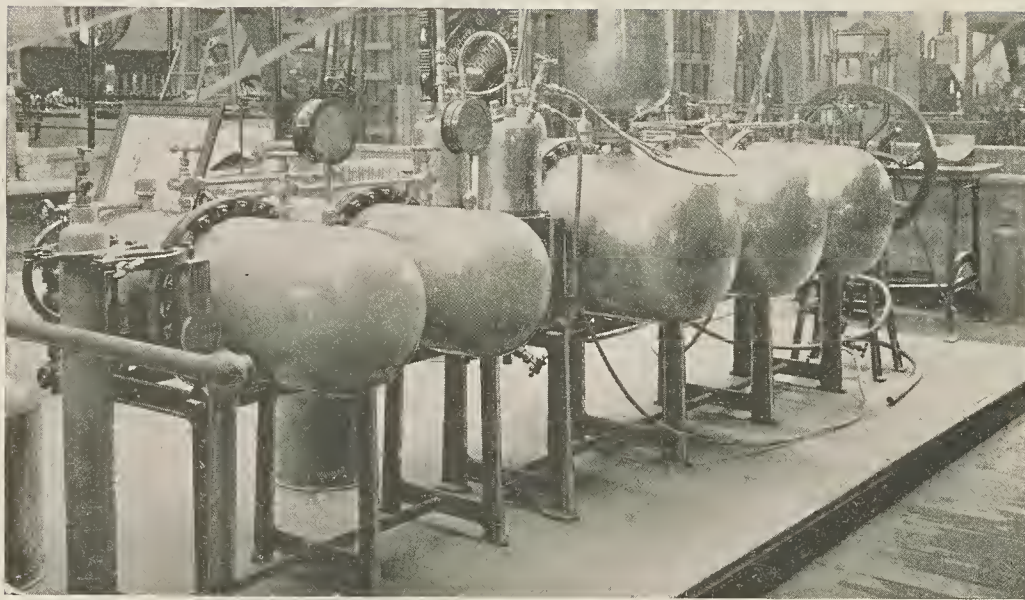
EDISON DYNAMOS



BARREL STAVE JOINER

looms are also largely produced. Of such as are used for fabrics made partially of cotton there are several collections; Pawtucket, Rhode Island, has a minor display, and the great manufacturing town of Lowell, the Manchester of America, with nearly 200 mills, with 25,000 looms at work, and more than 1,000,000 spindles, is represented at the great World's Fair by a single cotton machine. Yet in the foundries and machine shops of Lowell are produced nearly all classes of apparatus such as is used in her factories. In a miniature cotton mill are demonstrated all the various processes of converting the raw material into finished goods. Cotton, fresh

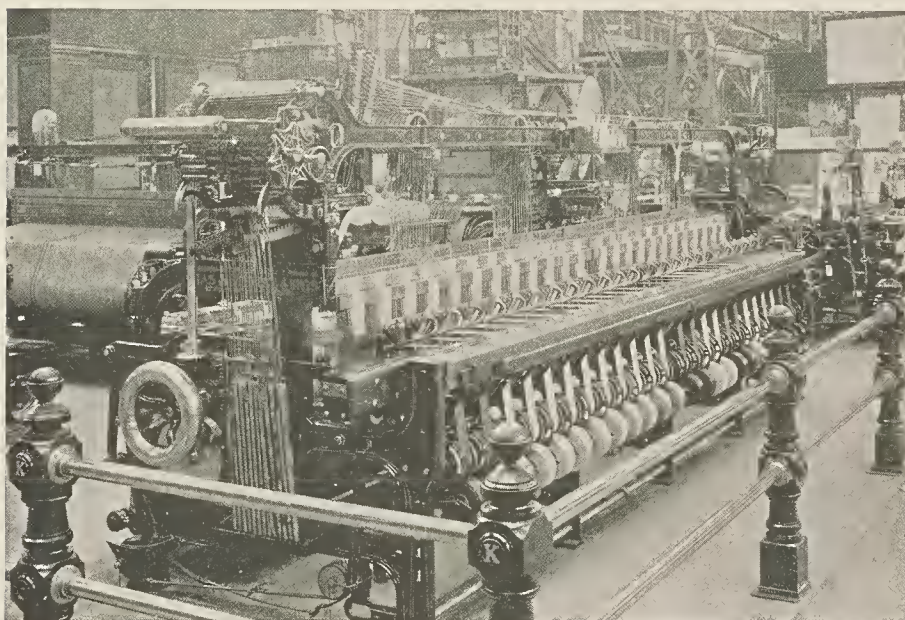
from the bale, is placed in the feeder, where it is freed from refuse, and then smoothed and carded into suitable lengths. Then, after other preliminary treatment, it is woven into fabrics, the spindles moving so rapidly that



SODA WATER APPARATUS

to the unpracticed eye they appear not to move at all.

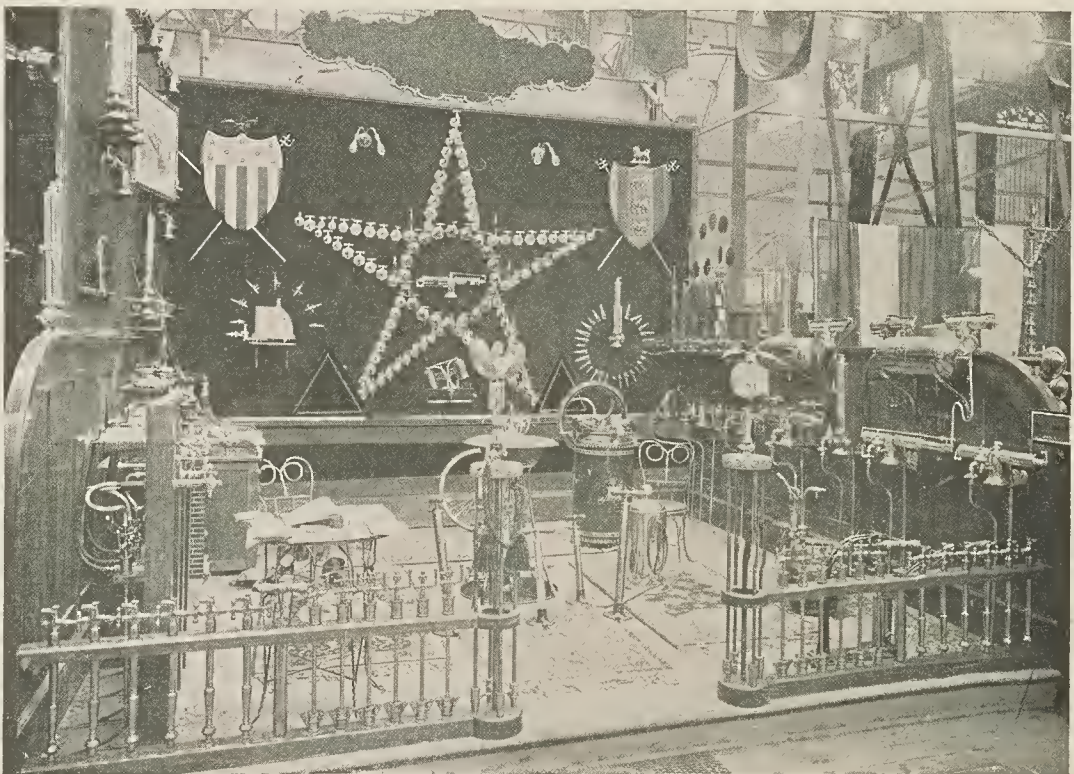
Another interesting process is that of making threads, which can be seen to excellent advantage in the exhibit of a Connecticut factory, its location, together with the character of its exhibits displayed by a sign, with the word "Willimantic" fashioned in spools of black thread on a background of white. Several times a minute the lettering is changed, the inscription alternating with that of spool-cotton, through some ingenious manipulation too swift for the eye to detect. By one of the machines, named a spool-winder, eight spools are wound at a time, each with 200 yards of thread; the thread is cut and fastened into a notch on the edge of the spool; the spools are labelled, and others take their place, all by automatic methods, and without a



RIBBON WEAVING LOOMS

moment's cessation. There are also ready wound bobbins for sewing and other machines, with balls of thread for various purposes; there are threads of all sizes and colors in the form of panels, and pillars, and on a revolving cylinder columns of spool cotton in every hue are being woven together, as by a braiding machine.

Of machines for knit underwear there are several in operation, producing yard after yard of fabric which, with but slight manipulation, is transformed into garments. In contrast with them are two hand machines, turned by cranks, and of primitive fashion. A Philadelphia firm has, among its collection, apparatus for making underwear trimmings at the rate of fifty yards an hour. Another Philadelphia



GAUGES AND COCKS

company has hosiery and mitten machines of various sizes. A Chicago company shows some swift-running specimens; but in this department the entire display is far from complete, some of the best machinery and such as is widely used for knit goods being omitted altogether from the group. Other textiles are also in process of manufacture, from jeans and homespun to the finest of laces and embroideries.

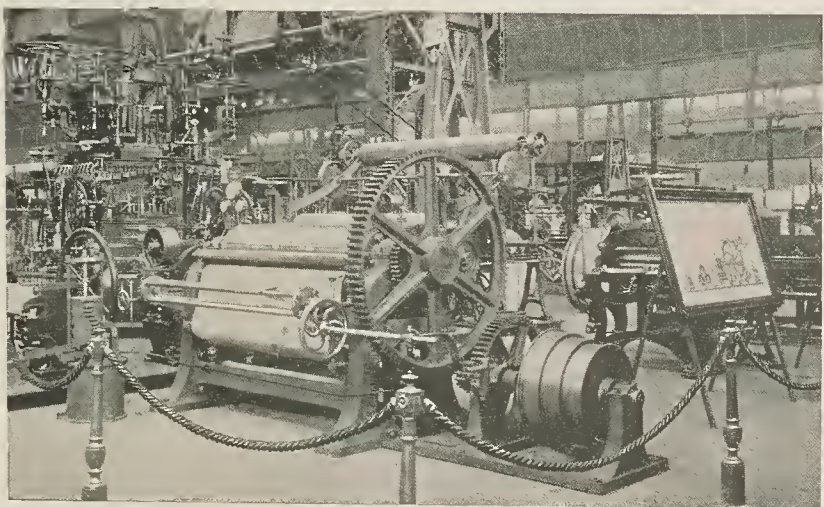
The exhibits of machinery for the production of clothing include such as is used for shoes and gloves; but no shoes are made in Machinery hall, the apparatus being adapted only to lining, cementing, heeling, and certain finishing processes, as the making of button-holes. Glove-

making is shown in all the stages whereby a

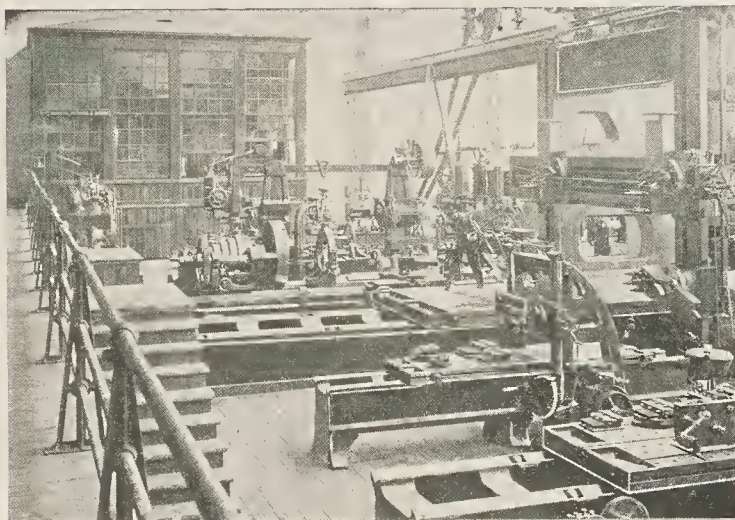
piece of tanned skin is converted into a pair of many buttoned kid, carefully stitched, perfumed, and packed, in readiness for use. There are also machines for belt-lacing, for working hides and leather, for harness, saddlery and whips, for rubber stamps, and felt goods. Of sewing machines for household and factory use, and for stitching leather and other heavy materials, there are several collections, but with little of special interest in this department.

Paper-making machinery is included, as I have said, among textile apparatus, and here may be observed the process whereby wood pulp is transformed into bulky rolls of paper ready for the printing-press. The pulp is made from spruce logs, cut into suitable lengths, ground, and mixed with sulphite, to

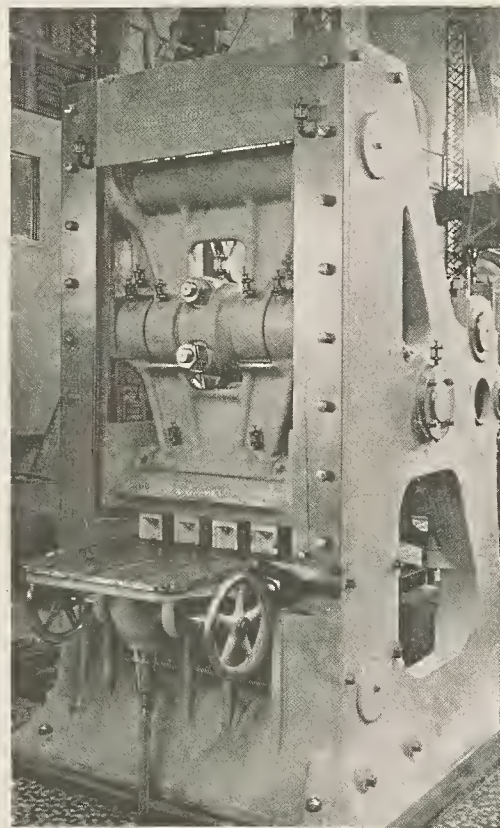
soften the fibre, and destroy all deleterious substances. When ready for the mill, the material is placed in the beater, and thoroughly mixed with the sizing, coloring, and other matter which enters into the finished product. Then, in a semi-liquid condition, it is drawn off into a storage tank beneath, and presently submitted to a further mixing and grinding operation performed by a so-called perfecting machine. As yet, however, the paper is anything but finished, resembling somewhat curdled cream, but of whiter complexion, and only after much further manipulation, which need not here be described, is ready to receive on its surface the news of the world.



FRENCH HEATING PRESS



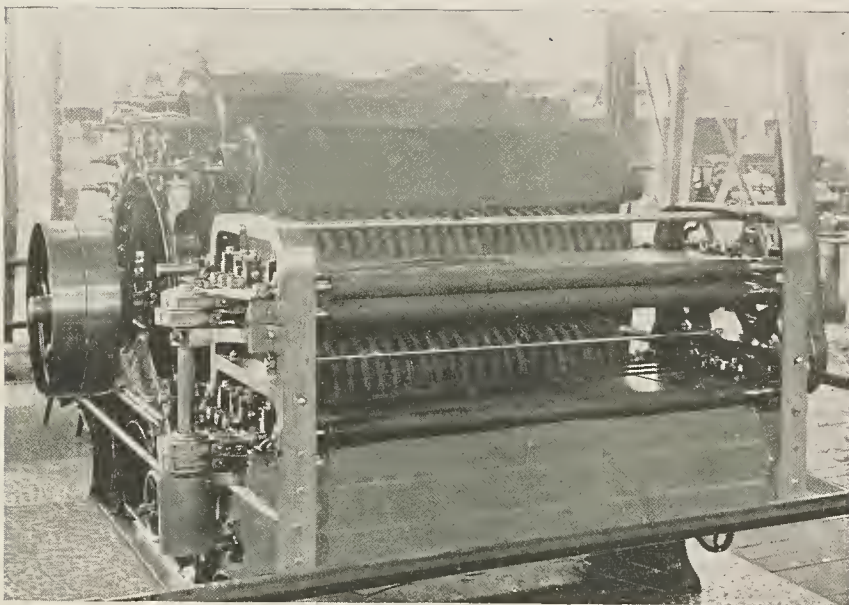
MODEL MACHINE SHOP



BRICK PRESS, CANADA

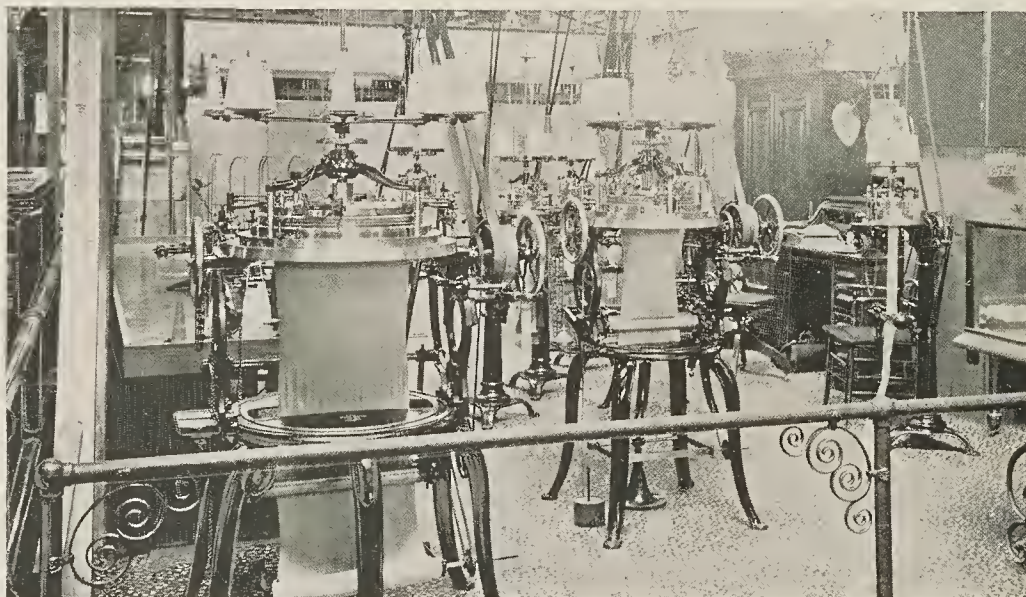
In this machine, fashioned at the Beloit Iron works, with a capacity of ten tons of paper a day, and occupying more than 100 feet of longitudinal floor space, are contained nearly 200 tons of steel and iron.

Nowhere better than in Machinery hall, and especially in the textile group, can the visitor study the industrial phases of factory life. Here may be seen at work operatives of the better class in the leading branches of manufacture, men and women working side by side in producing the countless articles for use or ornament which grow into shape before the eyes of the observer. While attending to their several tasks, they are always ready to answer questions or to offer brief explanations, the latter, however, too thickly interlarded with technical phrase to throw much light on the subject;

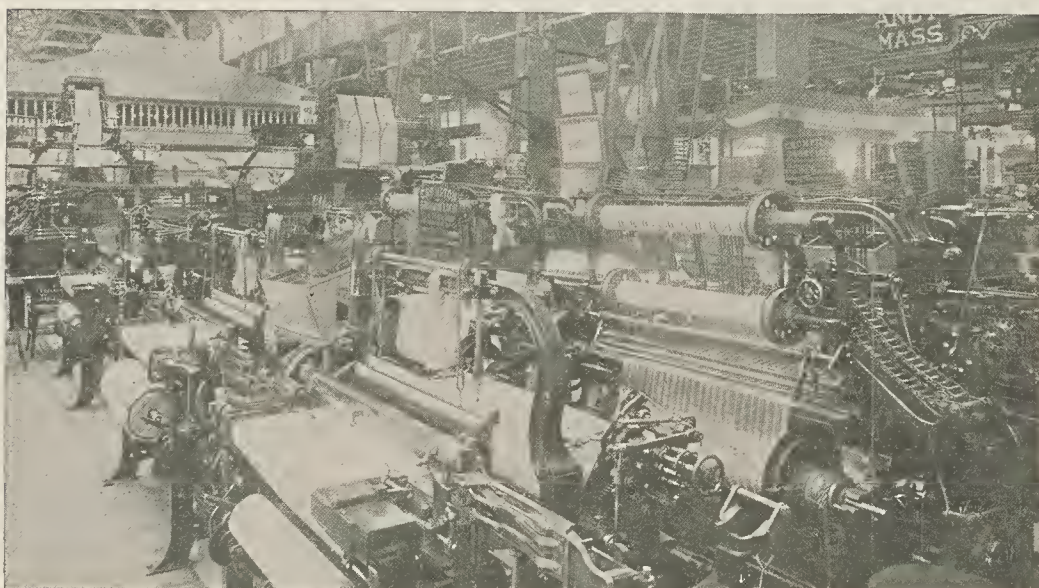


WEAVING LOOM

contrast with the swift-running presses of to-day, turning out their thirty-two page newspapers at the rate of 12,000 an hour, is this ungainly relic of a by-gone age, with its angular wooden frame, its rusty crank, and its long old-fashioned slide, the structure creaking and groaning under its task of printing on one side some 300 miniature sheets an hour, each twelve by sixteen inches. A still more ancient specimen is the original Bradford press, the first one used in New York, with a model of the pioneer printing-office established in that city by William Bradford, on the 15th of April, 1693. Here also is the first printing-press used in New Hampshire, made by one Thomas Draper of Boston in 1742, later used by the state printer, and after other changes of ownership passing into the hands of its exhibitor, the Campbell Printing Press Manufacturing company. Among other curiosities is an old Ramage press exhibited by a Chicago company, together with samples of its type-casting machines. Side by side with these primitive appliances are marvels of printing mechanism, into one side of which the paper passes fresh from the roll in long unbroken line, and from the other comes forth in the form of printed and folded journals, at the rate of many thousands an hour.



KNITTING MACHINES



COTTON AND WOOLEN WEAVING LOOMS

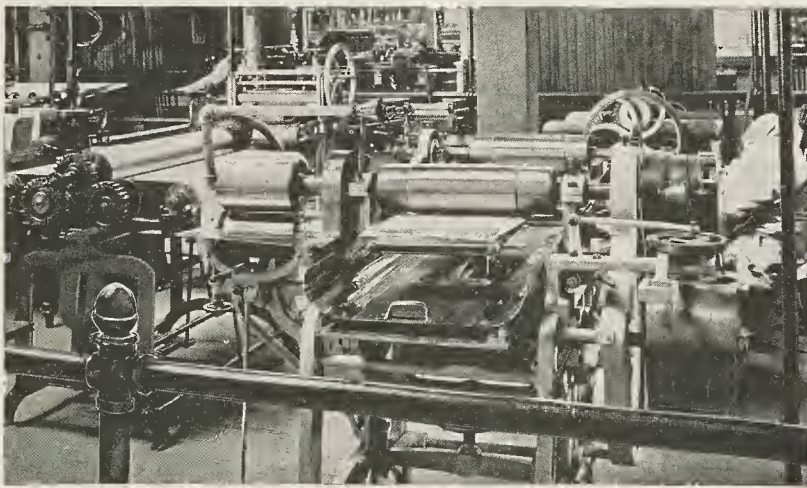
for what seems to them as simple as the alphabet is to the average spectator a labyrinth of mysteries. Nevertheless one may learn as much from these miniature mills and factories as by making a tour of the manufacturing centres of the United States.

Extending along the northern aisle and adjacent to the textile group is the Printing-press row of Machinery hall, where, covering more than 12,000 square feet of space, are presses, type-setting, type-casting, electro-typing, paper-cutting, book-binding, and other apparatus, the first including machines of various designs and dates, from such as did duty in the colonial era to those of modern make. Among the former, and included in the Hoe exhibit, is one of antique fashion, made by the same man, and of the same pattern as that which Benjamin Franklin used while working as a journeyman printer in London. In strange

Of printing-presses there is at least a score of exhibitors, some of them including stereotyping, electro-typing, paper-cutting, and other apparatus. Included in this group are samples of all descriptions, from perfecting presses to such as are used for job work. First may be mentioned those of Richard Hoe and company, whose eight and ten-cylinder presses, throwing off 20,000 impressions an hour, and introduced about the middle of the century in New York, Philadelphia, and London, were supposed to represent the final limit of workmanship and speed. Soon, however, in the leading newspaper offices, where time is counted by

seconds, web perfecting presses were reeling off their eight-page journals at the rate of 700 or 800 a minute. One of the highest forms of development is found in the Hoe quadruple web-perfecting press, now largely used by popular newspapers with their mammoth Sunday editions. By this machine a four-page newspaper can be printed and folded at the rate of 90,000 an hour; one of six or eight pages at half that speed, one of from ten to sixteen pages at 24,000, and one of twenty-four to thirty-two pages at 12,000 an hour. Some of these processes may be seen in actual operation in Printing-press row, not only on Hoe machines but on those of the Goss, Potter, and Scott patterns, all of which are here on exposition.

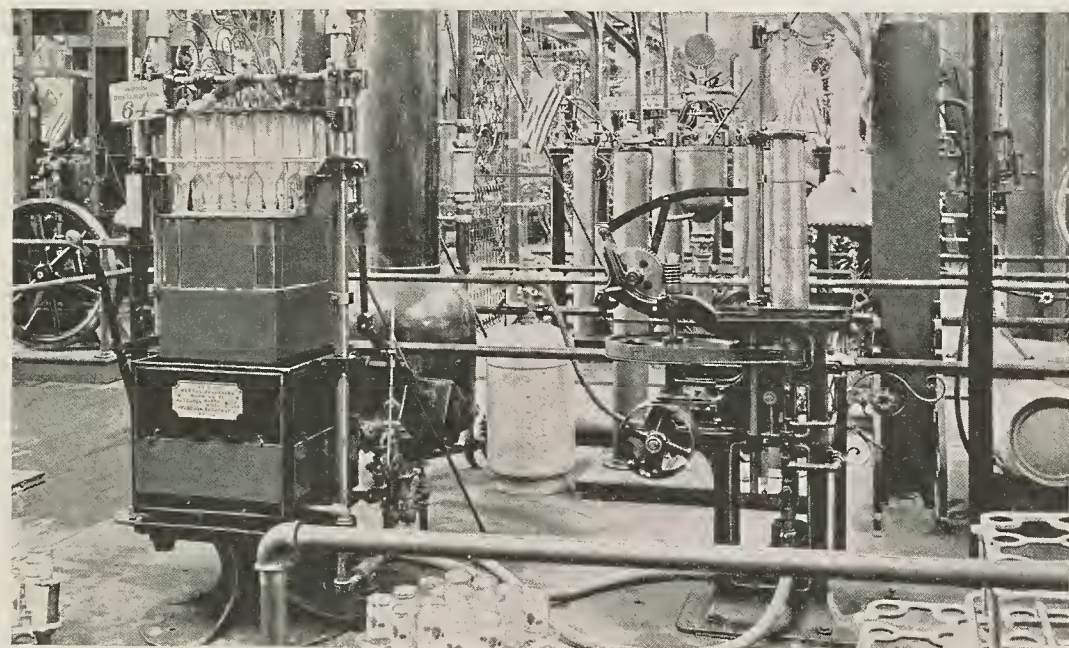
To the majority of Exposition sight-seers it may not be known that the newspapers laid on their breakfast or dinner tables were printed in Machinery hall; but here we may observe the entire process whereby from these perfecting presses are issued, more swiftly than the eye can count them, the sheets of several Chicago journals. In a separate building, south of the western annex, was installed through lack of space, and as a



LAUNDRY AND MANGLE EXHIBIT

precaution against fire, the electro-typing machinery, forming probably the largest collection ever contained within a single edifice, with complete sets of the most recent and approved apparatus fashioned by leading manufacturers. These are also in actual operation, and thus may be seen how a newspaper is born into the world, from the making of its stereotype plates from papier-maché matrices, until the finished and folded sheets are ready for the newsboy, all eager to disturb with reiterated cry the morning sleep of the Fair pilgrim.

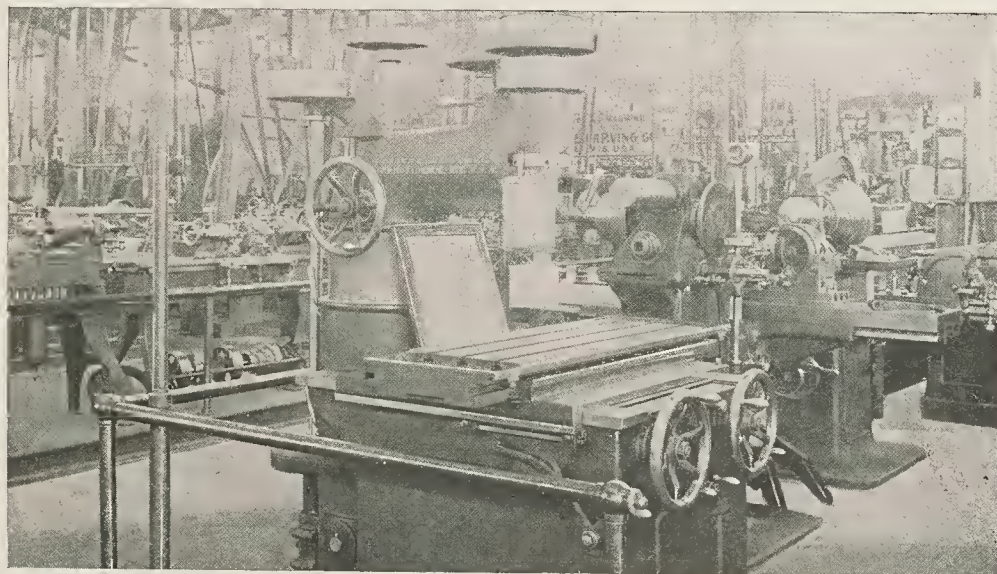
Chicago is well represented in this department by five exhibiting firms, one of them the Goss Printing-press company, three of whose



BOTTLE CLEANING APPARATUS

perfecting presses are here at work. The Miehle Printing Press and Manufacturing company has also a press in operation, of Chicago invention and make, on which is printed the page now before the reader, that is to say *The Book of the Fair*. Another Chicago firm displays its printing and job presses, with electro-typing and paper-cutting machines. The remaining exhibits are from New York, New Jersey, New England, and mid-continental states. Near this section a New York company has an interesting collection illustrating the evolution of type-foundries. First is the primitive apparatus in the form of a hand-mold, made in 1793; then one with rotary motion, of the date of 1840; another worked by steam and fashioned in 1870, and finally the perfected mechanism of 1893. Of type-setting machines there are several exhibits, one firm displaying also a type-line casting machine, and of printers' materials and miscellaneous appliances there are one or two assortments.

Of paper-cutting and paper-folding apparatus there are many specimens, and among the former may be seen at work some of the largest machines of their kind, run by heavy leather belting, and requiring only a turn of the wrist to cut through a ream of the thickest

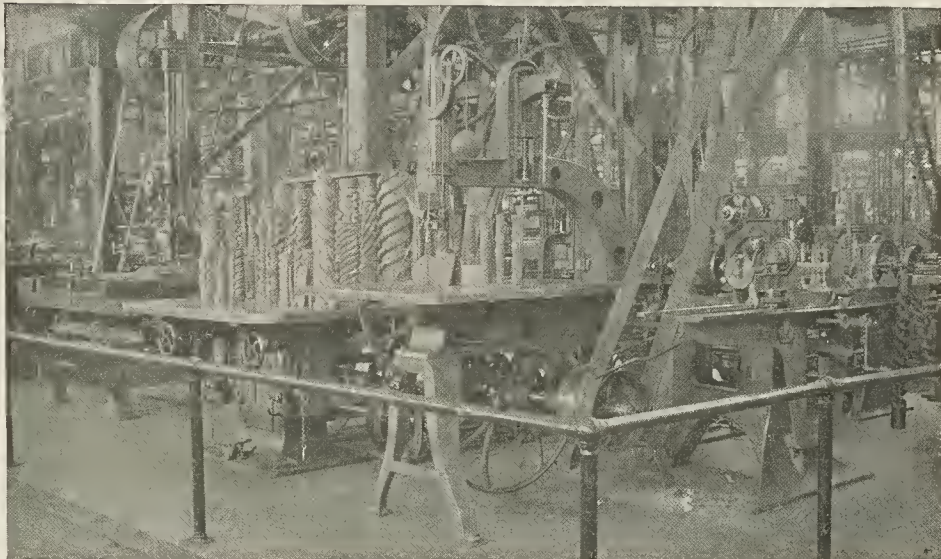


CHUCKING MACHINERY

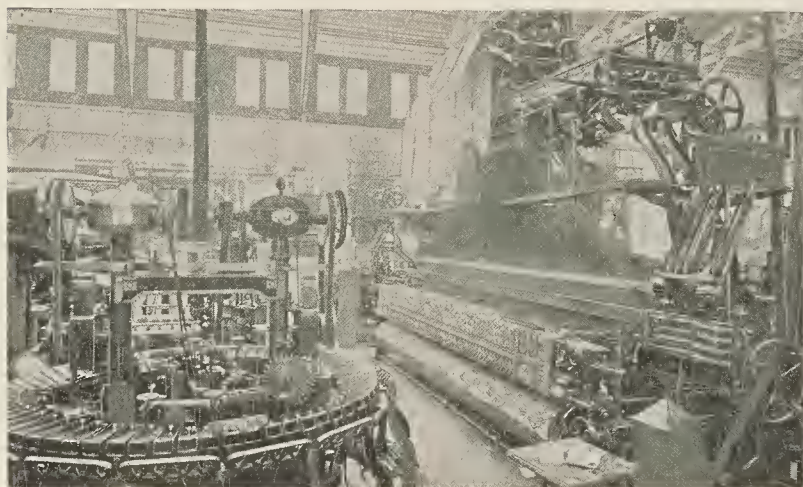
paper as though it were a roll of butter or a mass of lard. The latter are used both for book and periodical work, with hand or automatic feed, and with all the improvements devised since first the folding-machine was introduced in the United States, some forty years ago. By a firm whose headquarters are at Little Falls, New York, are displayed its paper-working appliances, such as are attached to ruling and folding machines, and printing-presses. Of book-binding and book-sewing machines there are several exhibits, the latter both for thread and wire stitching, and there are a few embossing and inking machines, some of them performing all grades of work with equal facility.

Few in number, but of excellent quality are the exhibits illustrating the various methods of lithography, color-printing and other processes, partly chemical, and partly mechanical, which have been devised as substitutes for the productions of the brush, the pen, the pencil, or crayon. By a New

York firm are displayed its lithographic distribution presses, and by Chicago exhibitors a multi-color process, and a duplex color ink-plate for printing-presses.



WOOD WORKING MACHINERY

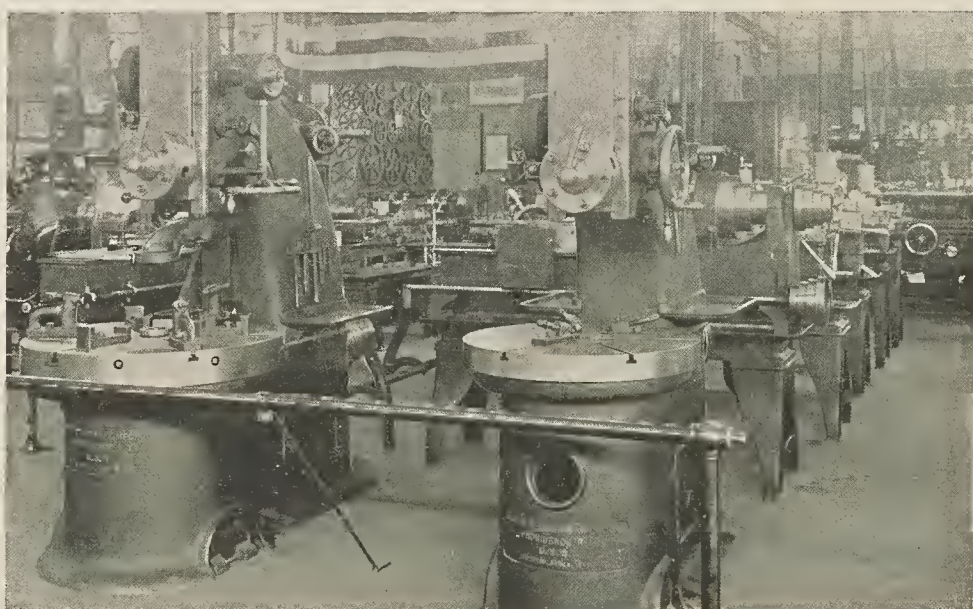


ART SQUARE LOOM

In the group of machinery for working in wood, separated from the textile section by the main longitudinal nave, is sufficient evidence of the rapid progress which recent years have witnessed in this department. But the limit has not yet been reached or even approached, and in few branches of mechanical invention are there greater possibilities. The turning-lathe, for instance, which a few years ago could only be used for shaping wood into rounded forms, will now give to it many varieties of outline, from square to spiral, and from oval to polygonal. So also with machines used for carving, stamping, molding, tonguing, and mortising lumber, and for all the various operations in which machinery does

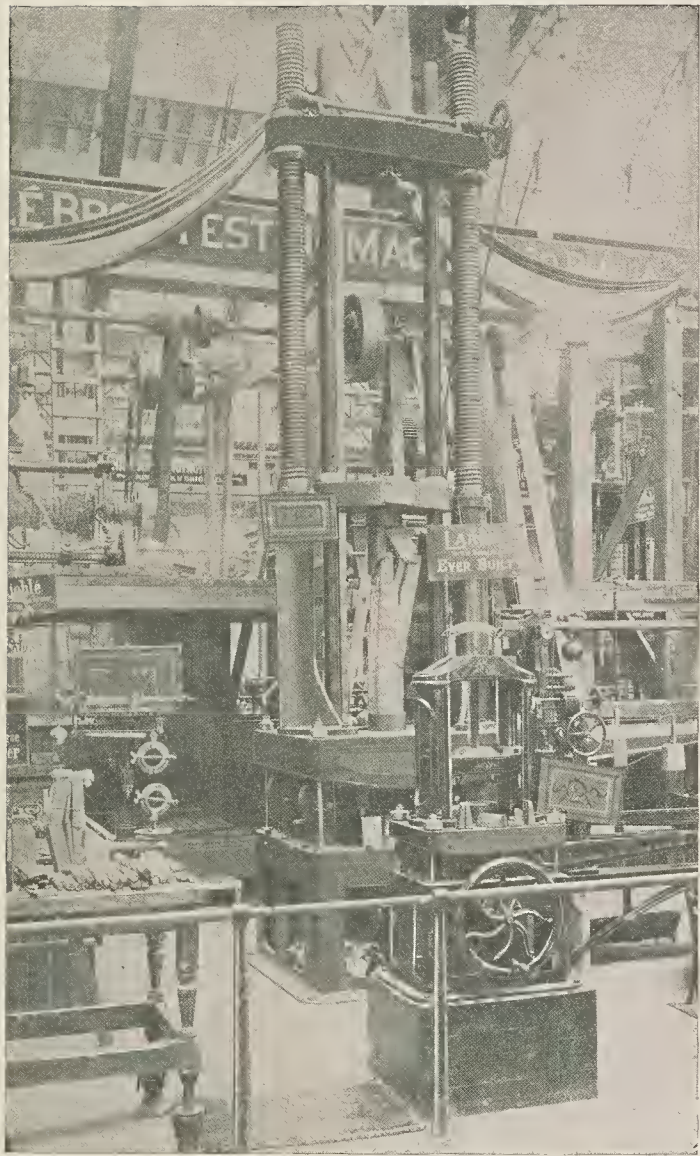
the work that was formerly done by hand. Yet in each of these processes there is still much room for improvement.

Among the more remarkable exhibits is one by a Pennsylvania manufacturer, in the form of a so-called geometrical machine. While not altogether new, there are few of this pattern in use in the United States; for here is a mechanism that can only be handled by the most skilful of mechanics, one producing perfect specimens of workmanship, and in all such figures in solid geometry as avail for practical use. A New York firm has special machines for the manufacture of the woodwork used in pianos and organs. Dubuque sends a swift-moving chain mortiser, in which chisels are entirely dispensed with, the chain revolving on pulleys of graduated sizes, according to the width of the mortise. Among other mortisers of special pattern is one used by a Chicago firm whose specialty is in the line of car-building machinery. By its carriage attachment of iron, moving on rails, and by the iron rollers on the upper part of the machine is greatly facilitated the handling of heavy lumber. The same firm shows a double mortiser, mainly for door-work, an almost perfect specimen of labor-saving machinery.



VERTICAL SPINDLE MILLING MACHINE

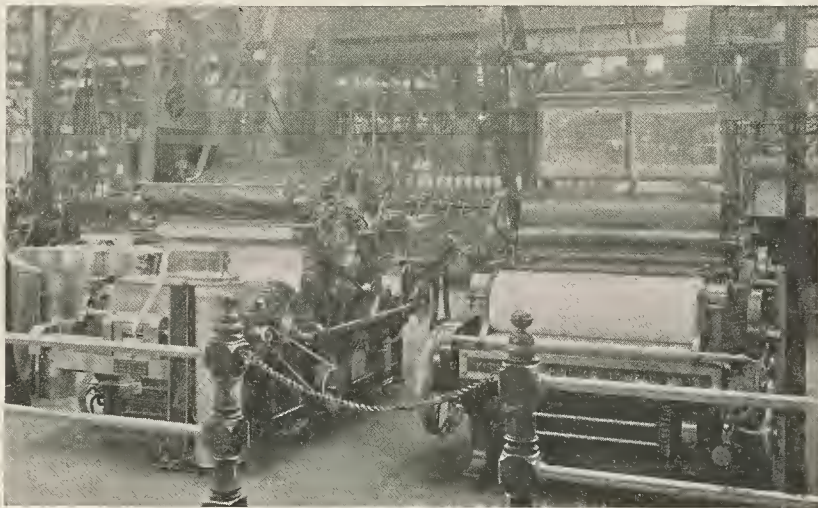
A Cincinnati manufacturer displays a matcher of improved design, with stationary bed, and of which the



RIEHLE TESTING MACHINE

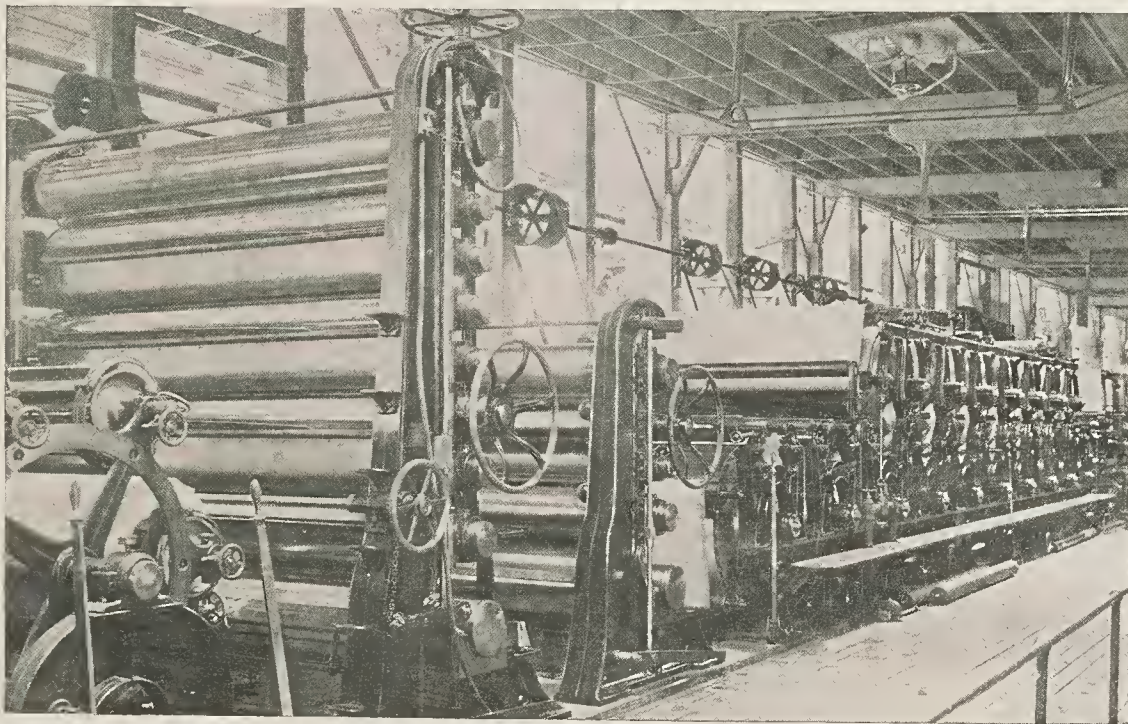
United States, and that its goods are made by distinct and patented processes. In a separate building is a model saw-mill, mentioned under the heading of Miscellany. Of wood-working machinery there are many samples, and among wood-carving appliances are some whose motions resemble those of the human arm. There are also wood-embossing, shingling, barrel-making, box-nailing, pattern-making, and other special apparatus, while a Cincinnati firm has specimens of machinery used in the navy yards of the United States. Although classified together, the machines for working stone, clay, glass, and other materials, and for making spikes and nails are grouped in widely separated portions of the hall. Several firms display their processes of grinding and finishing lenses, and here may be observed the method of manufacturing wire nails. Another miscellaneous class is grouped near the water-tank, in the western sections of the annex. It includes all kinds of dynamometers for testing the strength of materials; the machinery used by jewellers, and opticians, and the laundry and dish washing apparatus. The laundry machines are of ingenious mechanism, and the more simple automatic dish-washers may be seen at work in the annex, and in several of the Exposition restaurants. Several eastern manufacturers have a large collection of watchmakers' tools; in one of these booths are made souvenir thimbles of gold and silver, and

heads and rollers can be raised or lowered, and the pressure increased at will by an automatic process. From a Boston firm comes a matcher and molder of similar pattern, but with improvements permitting greater facility in working. Buffalo shows a planer which will work on the four sides of a piece of timber. Somewhat of a novelty is an ingraining machine from Hutton, Pennsylvania, whereby white-faced woods, as pine, spruce, maple, birch, and poplar are transformed into perfect

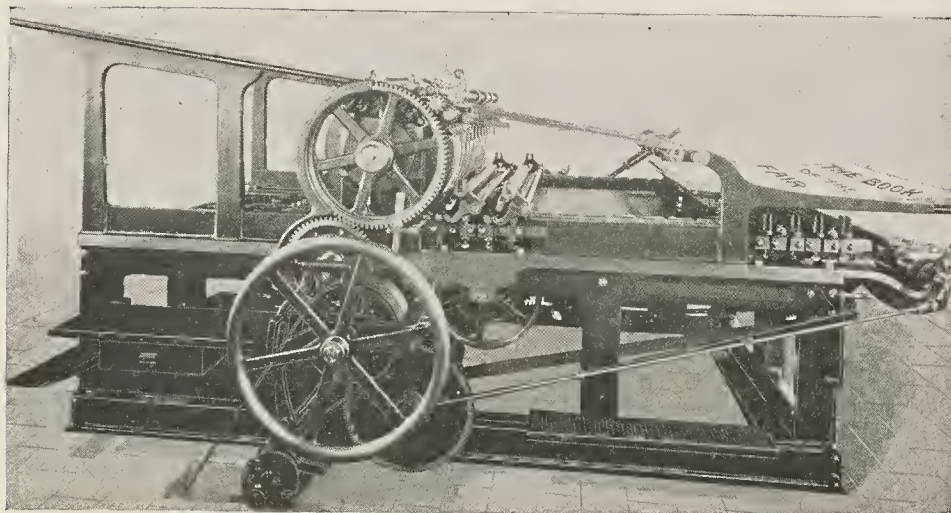


LOWELL COTTON MACHINERY

imitations of quartered oak or other high-priced articles, and thus almost doubled in value. The designs are painted on a drum with thirty-inch face, revolving three times a minute, and capable of treating 6,000 feet of lumber an hour, to which it gives an additional value of about \$20 a thousand, thus earning \$1,200 for each working day. Saws and sawing-machines, files and filing machines are liberally represented, a Fitchburg, Massachusetts, company, established in 1832, claiming to be the largest manufacturers of saws and machine-knives in the



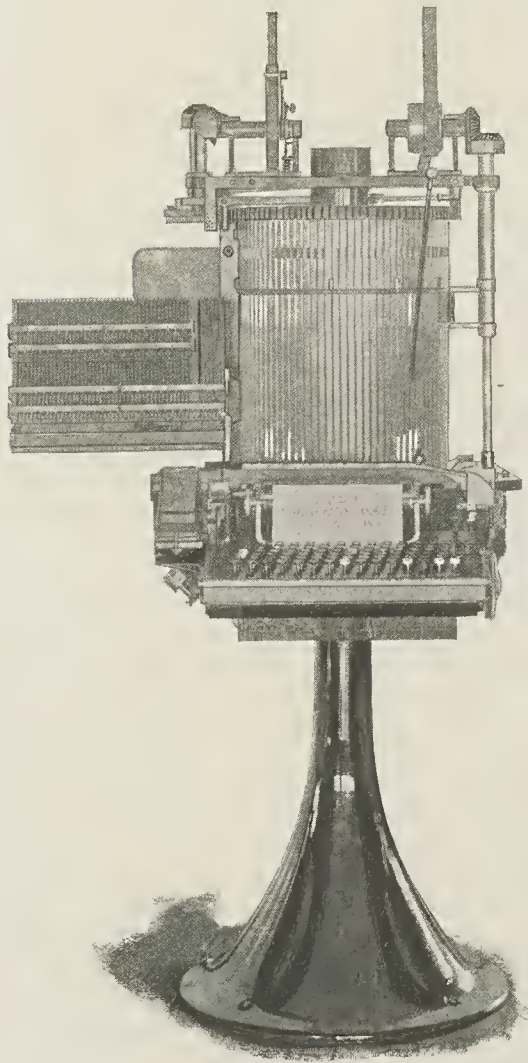
PAPER MAKING MACHINE



THE MIEHLE PRINTING PRESS

mills of all kinds for the preparation of cereals, coffee, and spices, together with bone crushers and models which show how the oil is extracted from cotton seed. Among the most ingenious mechanisms is one for pouring the beans into bags, arranged on a movable plate, and remaining just long enough to receive one pound of coffee, after which they are sealed, labelled, and passed forward for inspection, by means of a travelling belt.

Except for a few specimens contained in Machinery hall, the exhibits of refrigerating apparatus and of ice-making machines were installed, as I have said, in the Cold Storage building, in the south-western portion of the grounds. Here were displayed the various methods of artificial freezing, and the several processes for the preservation of such perishable articles as fruit, meat, eggs, and butter. In the manufacture of ice, filtered water, and condensed and purified steam were the principal materials used. Of this building, and its destruction by fire a description is given at the close of this chapter under the heading of World's Fair Miscellany.



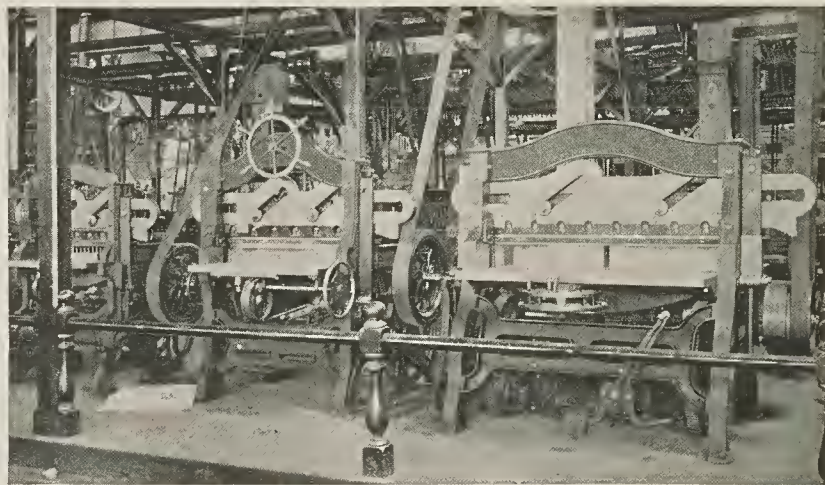
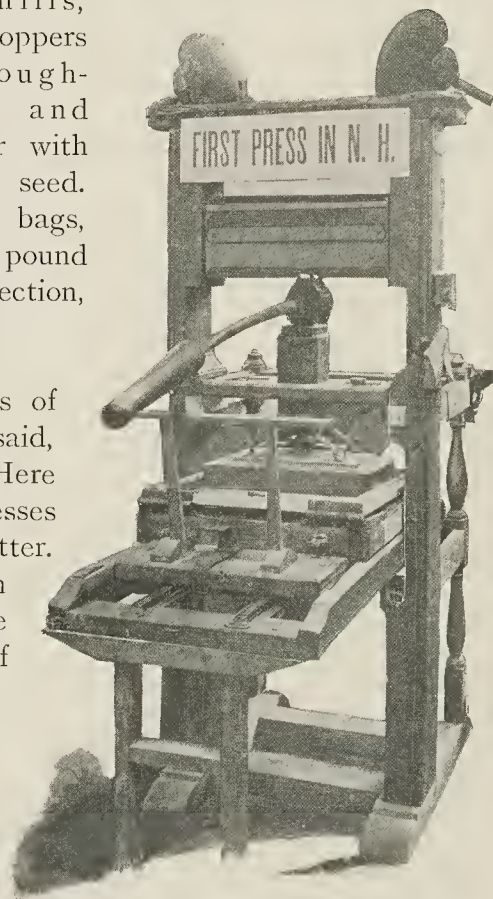
TYPE-SETTING MACHINE

Turning to the foreign sections in Machinery hall we find that, as in other departments, the German groups have been selected and arranged with special care, furnishing sufficient proof, if proof were needed, that the empire is holding its own in the markets of the world. For general purposes this branch of industry, as represented in the Fatherland, may be classed in three divisions; first, the casting of iron; second, the construction of machinery; and third, the conversion of manufactured iron into structural forms. Year by year these industries are assuming larger proportions, and while gaining in volume are gaining far more in quality. Of castings alone there were produced in 1890 more than 1,000,000 tons, keeping busy 1,150 establishments, and affording employment to 64,000 operatives. In the production of machines and apparatus of all descriptions at least 200,000 persons were employed, with exports for that year exceeding 80,000 tons, and valued at nearly \$20,000,000.

Passing through the northern portal of the hall the visitor enters at once the German section, occupying

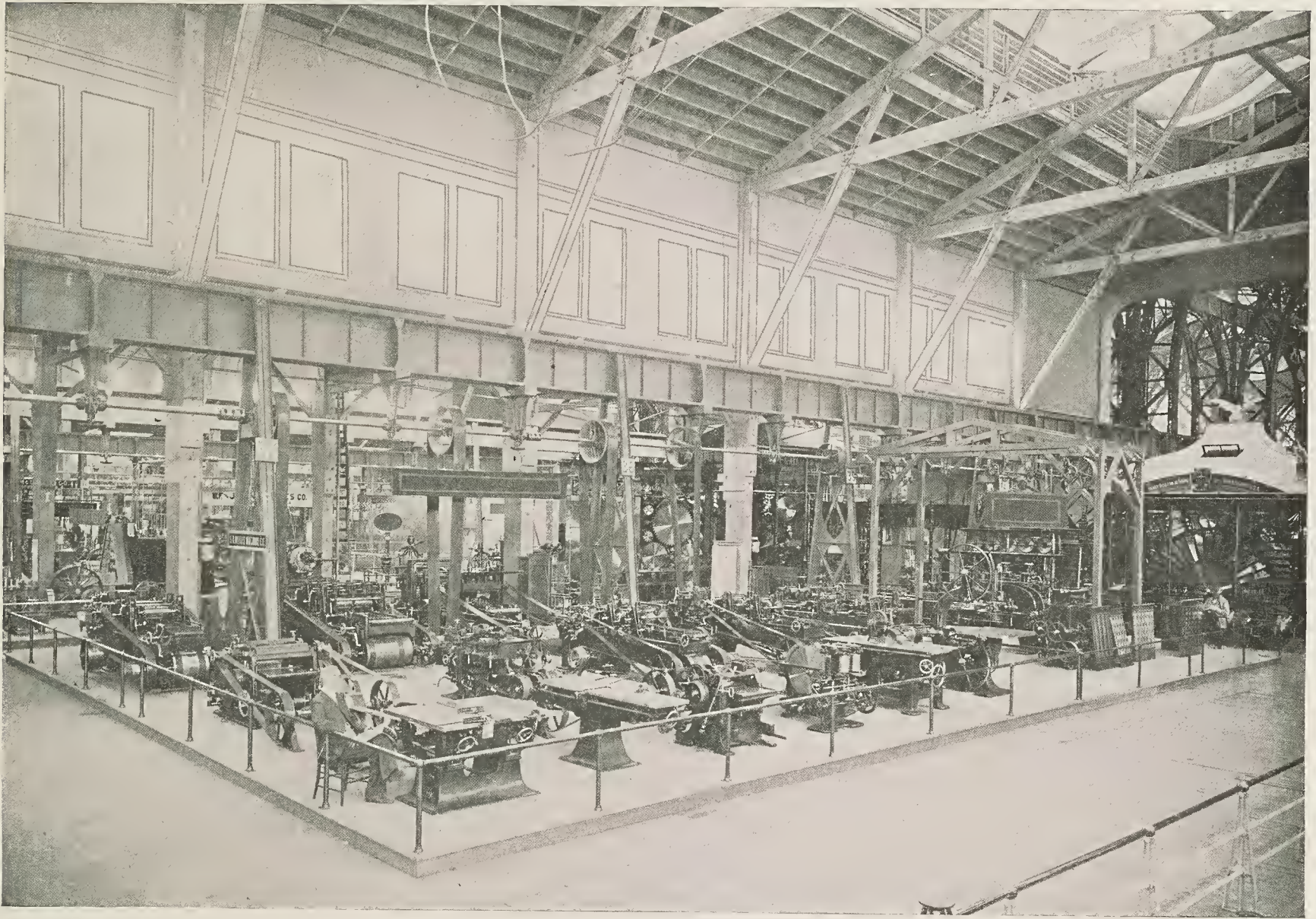
in the main hall a Chicago company displays its method of manufacturing pens. To the miscellaneous classes also belong the exhibit of road-making and street-cleaning machines, placed outside the building.

In the northwest corner of the annex is a collection of apparatus for the preparation of various articles of food. In one large pavilion a Milwaukee manufacturer has an extensive display of flour-mill machinery, and by an eastern firm are exhibited portable flour-mills. Then there are chocolate and sugar mills, meat-choppers and dough-mixers, and



SELF CLAMPING PAPER CUTTING MACHINE

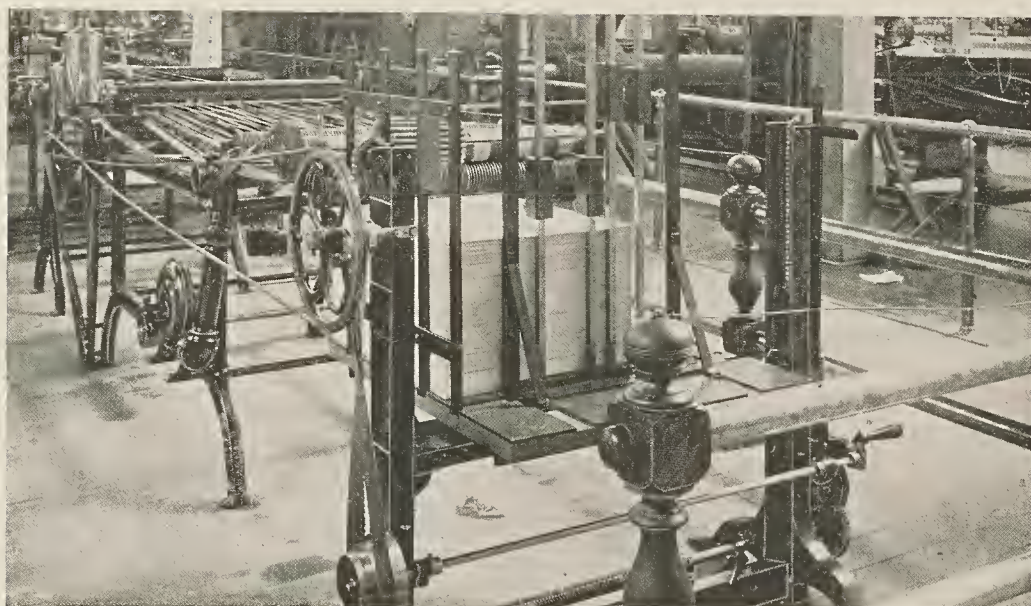
50,000 square feet of space, and flanked by the British division. But here are contained only portions of the German exhibits, agricultural implements, mining apparatus, locomotives, dynamos, and other machinery being housed in the various departments to which they belong. At the intersection of the main aisles is a triple expansion engine, connected with a dynamo, for illumination purposes, and for the transmission of electric power. This engine, built by an Elbing manufacturer in western Prussia, is of 1,000 horse-power, its frame entirely of wrought iron, its stroke of 28 inches, and its revolutions at the rate of 100 to the minute. At its side, is a smaller engine, forming its counterpart in miniature, and used for driving a portion of the shafting in Machinery hall. Adjacent to this group are the gas and petroleum engines, the largest not exceeding thirty-five, and the smallest of three horse-power. As in England, these machines are rapidly gaining in favor, and of especial excellence are those of German make. By one of the exhibiting firms, employing 1,000 workmen, and with a branch factory in Philadelphia, have been produced some 40,000 engines, since their works were opened in 1864, as the pioneer enterprise in this department, now protected by patents in many countries.



WOOD WORKING MACHINERY

East of these exhibits is that of a Leipsic firm, whose specialty is the manufacture of sawing-machines and machines for working in wood, of which their 600 workmen have already produced some 24,000 specimens. Here is reproduced what is claimed to be the largest saw-mill in existence, but one that appears somewhat crude as compared with American models, and with few of the time and labor-saving devices contained in the latter. In charge of expert workmen is a large collection of apparatus in actual operation. Still further east a Düsseldorf factory, with a branch establishment at Pittsburg, has a display of machine-tools and saws of all sizes and patterns, from hand, jig, and circular saws, to such as will cut the thickest armor plate. One fashioned for the latter purpose is more than four feet in diameter, with teeth half an inch thick, and of the hardest steel. In the north-east corner of this section another Düsseldorf firm shows its machines for making armor and hand-chains, with wire-nail, riveting, and other presses. At the western extremity a Nuremberg manufacturer exhibits fine wires of brass, steel, and German silver, some of them in skeins as delicate as silk, with wire brushes for household, and other purposes.

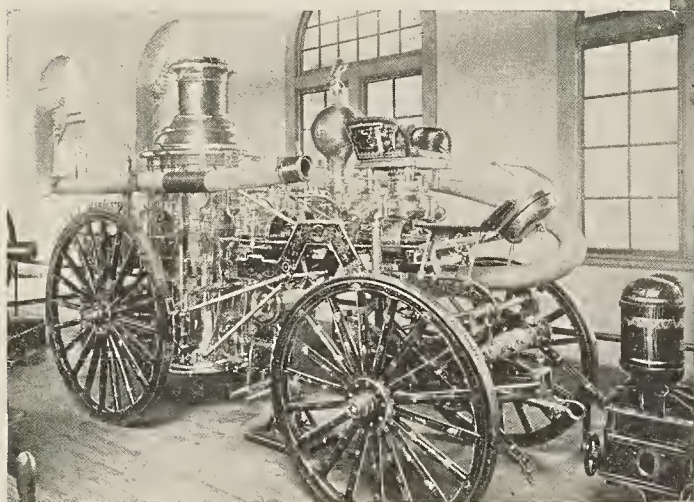
As displayed at the Fair the German machines for working in wood and metals are strongly and carefully fashioned, and well provided with safeguards; but somewhat cumbersome, lacking in finish, and in other respects inferior to those of American make. Nevertheless there are among these groups appliances well worthy of



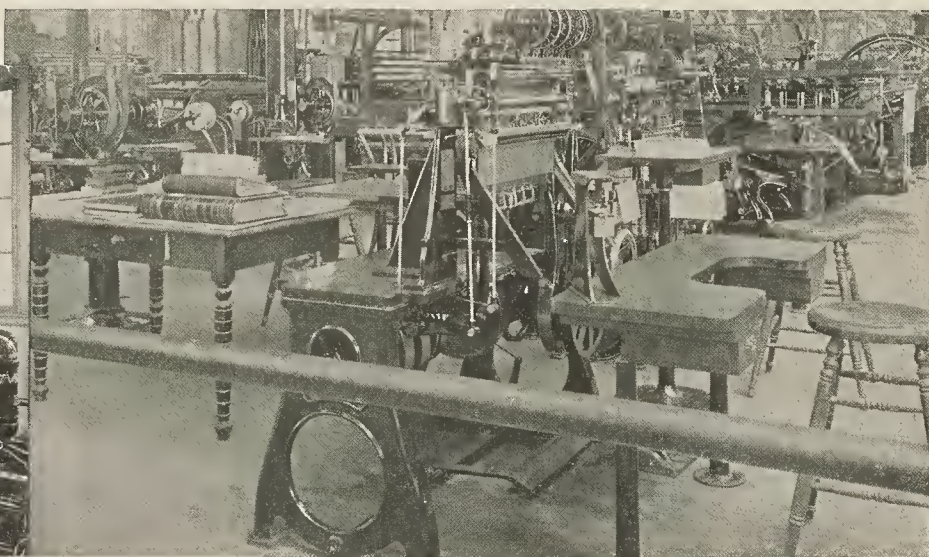
BOOKBINDERS' DOUBLE DISK RULING MACHINE

consideration. Such, for instance, is the one used for planing and molding, in which the lumber, after being placed in the machine, is stripped of its outside covering by knives with a rotary motion, and the finish imparted by stationary knives over which the lumber passes. It is then carried by rollers to other apparatus by which it is planed to the required thickness, and tongued and grooved for flooring, ceiling, wainscoting, and various uses. Another machine of similar pattern can produce 50,000 feet of flooring a day, and a third, in the form of a hand-feed planer and jointner, is one that might be used to advantage by our own mechanics.

A minor but interesting exhibit, adjoining that of the Düsseldorf firm, is a match factory, where may be observed the process of making matches together with the boxes that contain them. A single machine, and that one worked by a single operative, can cut 12,000,000 matches a day from blocks of wood prepared for the purpose. By an ingenious contrivance more than 2,000 matches at a time can be dipped in the igniting substance, a counterfeit being used for the purpose of illustration, as inflammable materials are



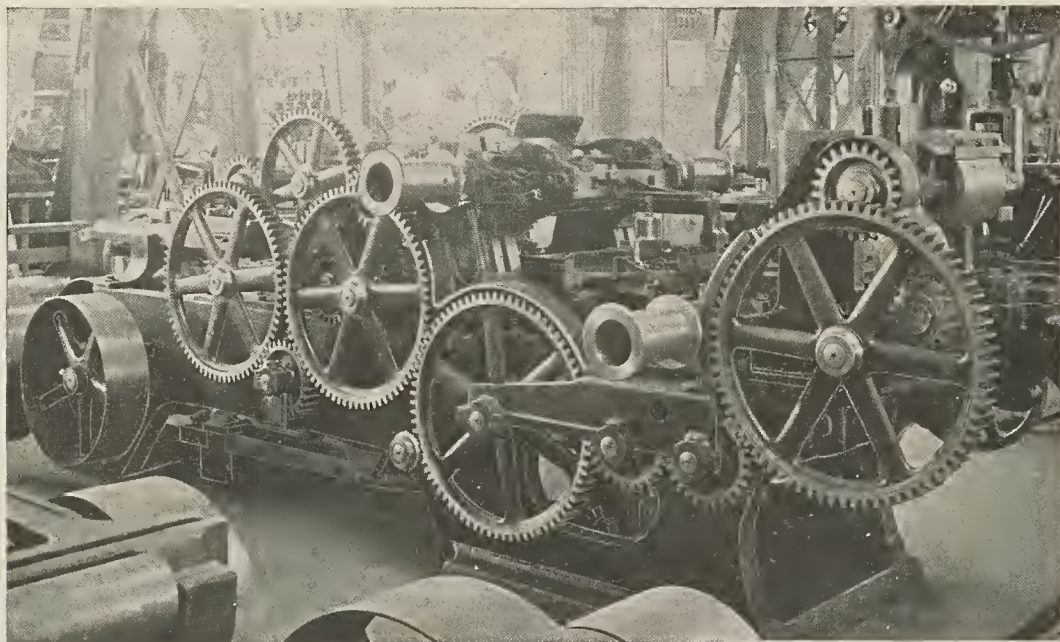
STEAM FIRE ENGINE



BOOKBINDERS' STITCHING MACHINE

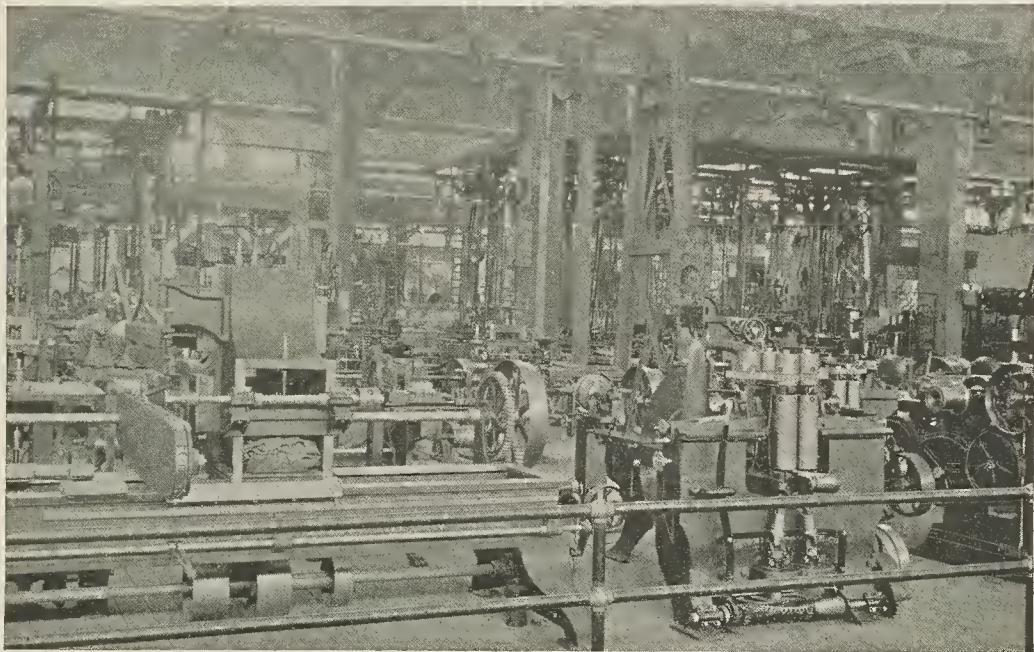
forbidden by the authorities. For preparing the boxes, there are two machines, one shaving the wood into very thin sheets, and another cutting, folding, and labelling at the rate of 30,000 or 40,000 a day.

German foundries and machine-shops are fairly represented in this section by exhibiting firms and companies



WOOD PLANING MACHINE

in addition to those already mentioned; but here it may be stated that the term machine-shop or machine-builder is not used in Germany in the American sense of the phrase, some of these establishments producing a large variety of articles. From a Magdeburg firm are specimens of its portable steam-engines, with extension tubular boilers, of which about 750 were manufactured in 1890-1, with a total of 15,500 horse-power. A Remscheid factory in Rhenish Prussia has samples of its seamless steel tubes, fashioned by a patented process in all descriptions of steel, with a large collection of miscellaneous articles, from boiler tubes to telegraph poles. A Gotha

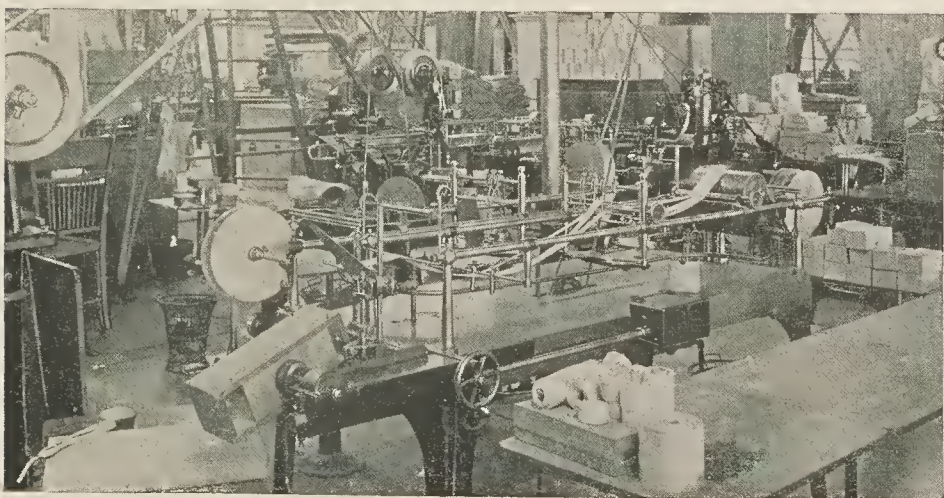


WOOD WORKING MACHINERY

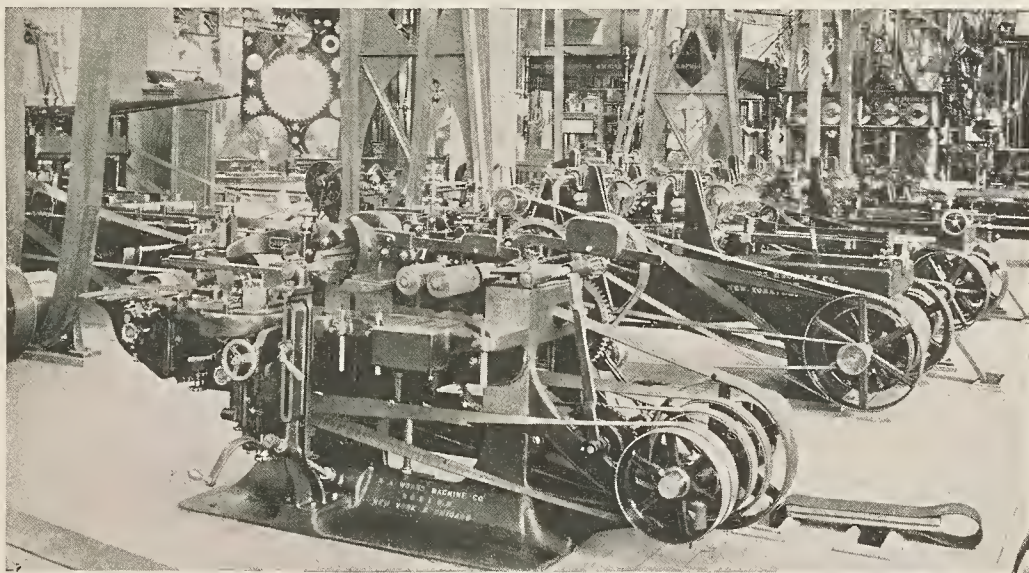
of endless driving ropes for the simultaneous transmission of power in several directions. Of fire-extinguishing apparatus there is but a single illustration, furnished by the oldest of German factories in this department. In the line of textile and other fabrics, including knit goods and embroidery, there are many samples of machinery and work. A Düsseldorf firm has a collection of apparatus for decorative purposes, and a Berlin house, cutting machines for the materials used in making garments of all descriptions. An exhibitor from the little Saxony town of Aue shows how he makes 6,000,000 sheet-metal bobbins a year, such as are serviceable in many branches of textile industries. From the same town comes a large assortment of carding, napping, pressing, and other apparatus, with spinning machines for woof and web. Knitting machines are well represented, and though working less swiftly than those of American make, produce more durable goods. In this connection

may also be mentioned the display of an asbestos factory at Frankfort-on-the-Main, by which are worked up more than 1,000 tons of raw material, largely procured from its mines at Black lake in the province of Quebec.

Of paper-making, paper-ruling, and book-binding machinery there are a few exhibits, and these for the most of old-fashioned apparatus, of which, however, many are furnished with modern improvements. In the entire hall there are but two paper-ruling machines of recent pattern, one a German, and the other an American invention, both using brass disks, fitted with metal rods, whereby the lines can be spaced to the thirtieth part of an inch. For the German machine, which is a model of simplicity and neatness, it is claimed that 4,000 sheets an hour can be ruled on both sides under the direction of a single operative. With a display of book-binding machinery a Dresden firm combines riveting and edging apparatus, and such as is used for the making of pasteboard boxes. By an Augsburg exhibitor is displayed a rotating machine for printing illustrations, and by a Heidelberg establishment a so-called lightning press, with automatic lifter and envelope feeder, by which can be printed 40,000 envelopes a day.



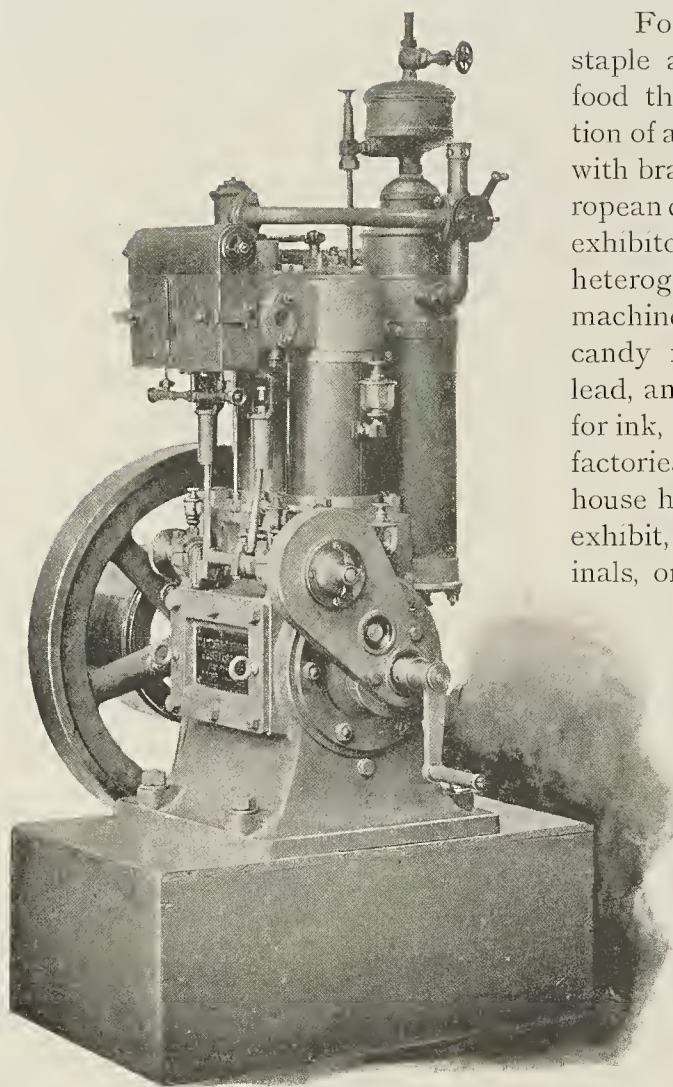
BOX-MAKING MACHINERY



WOOD MOULDING MACHINES

foundry displays its turbines, with a capacity of 50 horse-power, and a velocity of 170 revolutions to the minute. Another Magdeburg company has a collection of crushing and grinding machinery, with models of gas engines, and the products of chilled and malleable iron. By a Hamburg firm are shown its smoke-consuming furnaces, of which several were ordered for the new Reichstag buildings in Berlin, another exhibitor making a specialty of water-tube boilers and apparatus for superheating steam.

Of power-transmitting appliances there are several exhibits, a Hamburg manufacturer supplying the belting which runs the machines of a dozen or more exhibitors. By another firm is shown the Rouleaux method



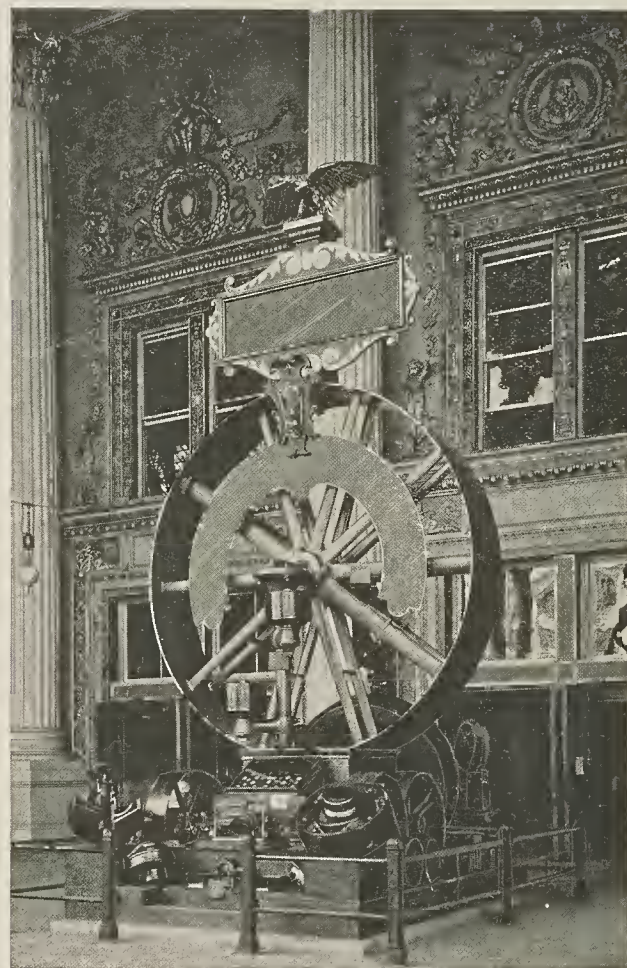
CYLINDER PETROLEUM ENGINE, GERMANY

For the production of staple and other articles of food there is a large collection of apparatus from a firm with branches in several European capitals. A Dresden exhibitor has a somewhat heterogeneous assortment of machines for chocolate and candy factories, for white-lead, and paint factories, and for ink, soap, and perfumery factories. A Brunswick house has an equally varied exhibit, with models, originals, or illustrations of tur-

bines and roll-tables, hydraulic machines, grain, oil, and other mills, and appliances for husking grain, and for giving color to rice. Still another Dresden establishment has samples of

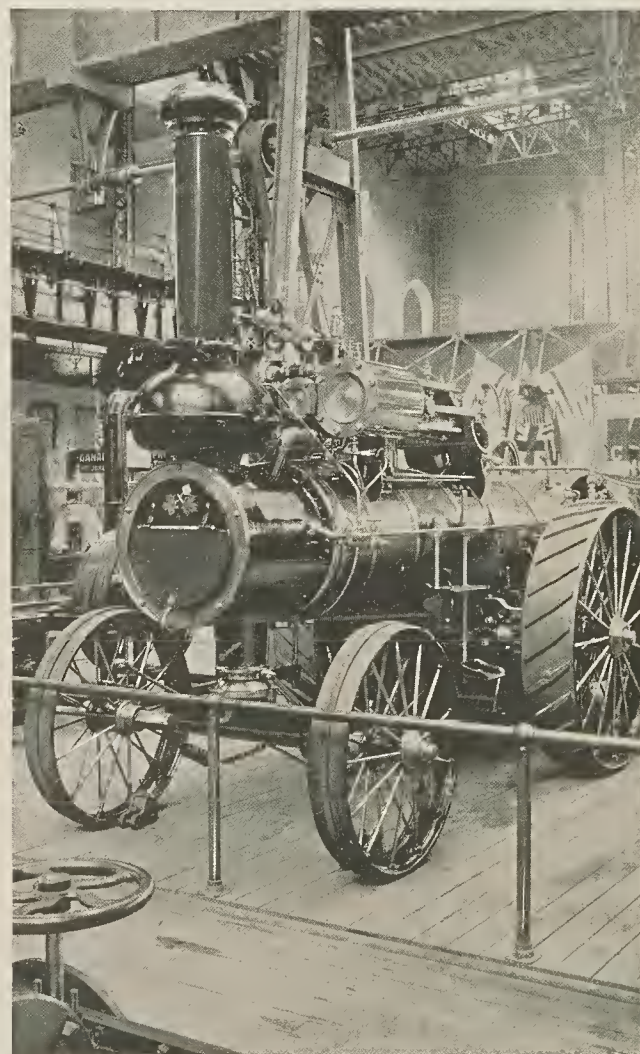
gas and steam-boiler furnaces, and their insulating materials for various purposes. A Hanover firm displays a number of patented pulley-blocks, and a Berlin house, with a branch in New York, its so-called smoke-hoods, used in the German and English navies, and its protective apparatus for firemen and others exposed to smoke and noxious vapors. Finally, there is a large collection of miscellaneous exhibits, including machinery and apparatus for cord and rope factories, for distilleries, for making shoes, for crushing rocks, for washing ores, for the manufacture of cement, and so forth till we come to meat and sausage machines, all forms of mechanism known to the Fatherland being here on exposition.

Great Britain is represented by a small but choice collection in the space assigned to her in the north-east corner of Machinery hall. Of late the tendency among British manufacturers has been



IN THE GERMAN SECTION

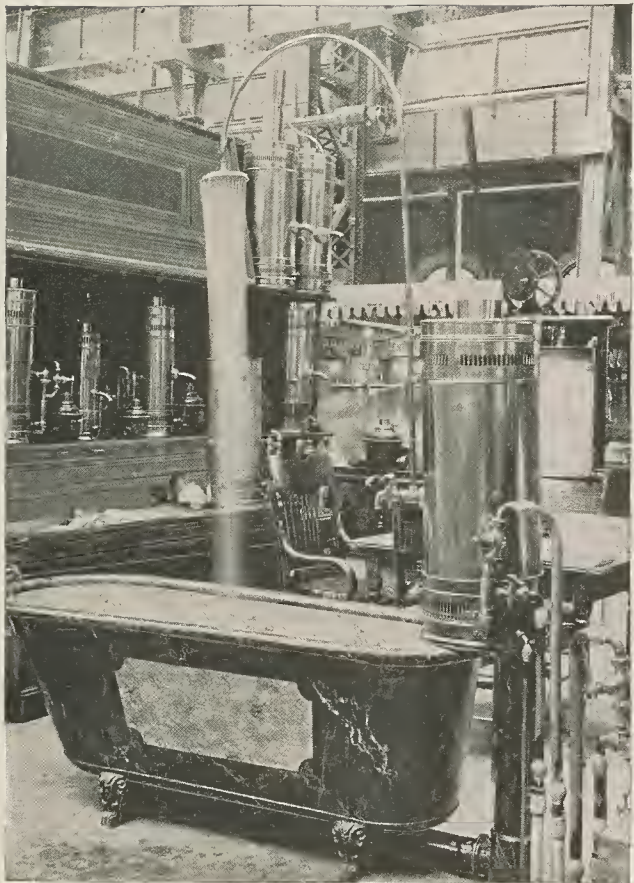
the 2,000 machines produced each year for automatic milling plants for flour-mills and warehouses. From Berlin works come specimens of their porcelains and earthenware, their gas-retorts, their



TRACTION ENGINE, CANADA

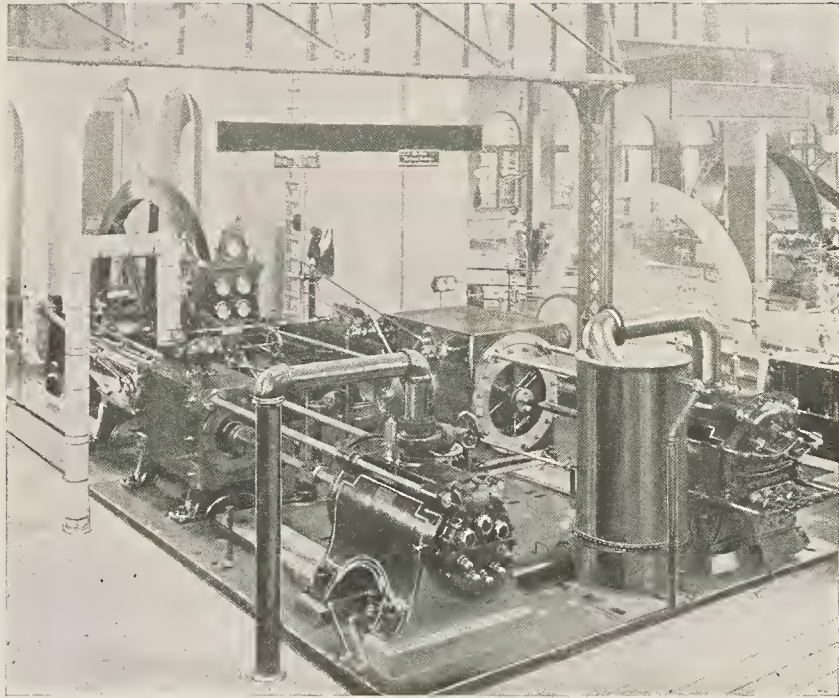


LARGE PROPELLOR FOR STEAMER "SPREE"



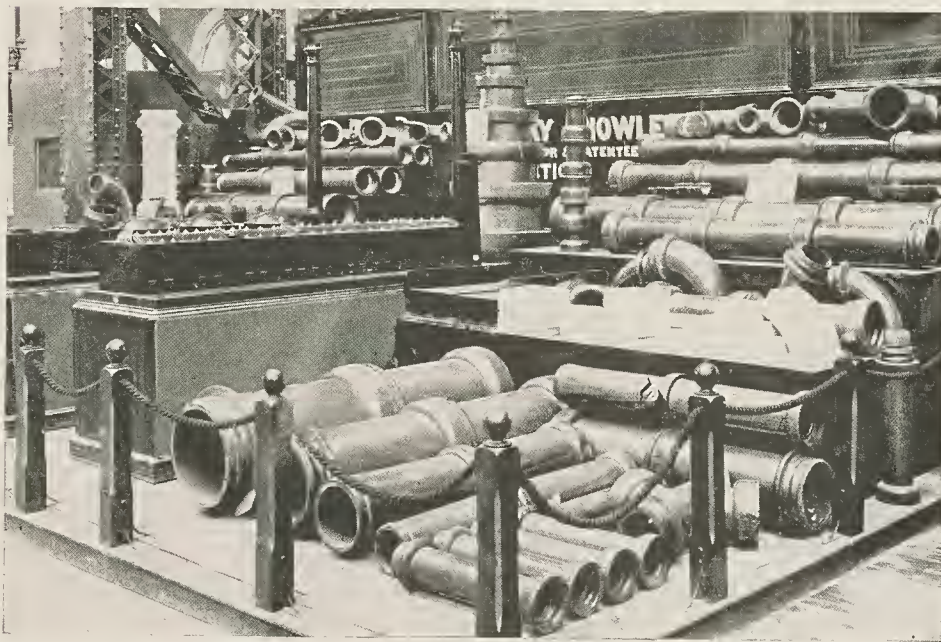
ENGLISH BATH TUB

special uses, but are supplied with apparatus for super-heating the steam before it enters the cylinders, and also for its thorough condensation, the same steam often being used in several cylinders. So with gas engines, which in some departments are rapidly superseding steam-engines. In the production of war material this specialization is about the only improvement made within recent years, machines being so constructed as to perform only a single operation, but to perform it to perfection. Such also is and long has been the drift in other branches of mechanism, and thus alone can England continue to compete with the United States, where within a year or two the production of a given article is often doubled or trebled by new labor-saving appliances.¹

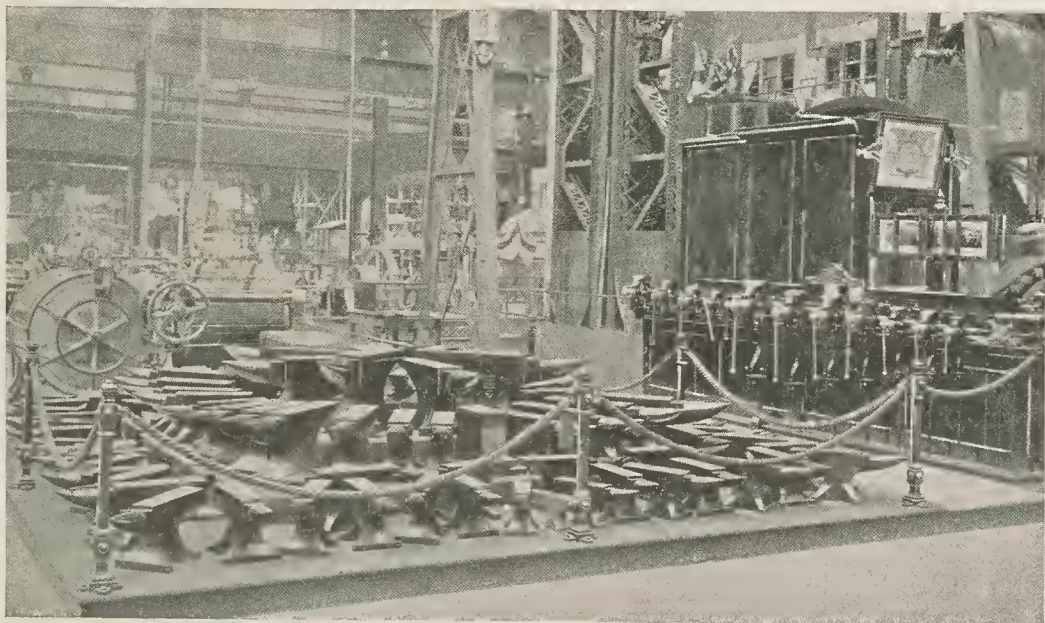


AIR COMPRESSOR

toward the construction of machines for particular lines of work, such as perform that work to the best advantage, and with the greatest economy of fuel and power. Steam engines, for instance, of all descriptions are not only modelled and proportioned for



ENGLISH TERRA COTTA DRAIN PIPES



ENGLISH ANVILS

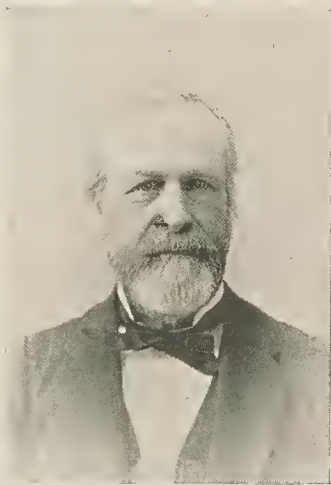
¹As an instance of the decadence of British manufactures, due largely to American competition, it may be stated that the production of raw and manufactured iron has diminished considerably within recent years, while that of Bessemer steel has barely held its own. Of iron ores the imports fell from more than 4,000,000 tons in 1889 to less than 3,200,000 tons in 1891. Of blast furnaces there were on an average 445 in operation during the former year, against 373 in the latter, and from 4,651 puddling furnaces in 1883, the number decreased to 3,015 in 1890. The entire exports of British merchandise shows a small loss for the ten years ending with 1892, and a more serious loss since 1890. In the export of textile fabrics, however, there was a decided gain, textile manufactures affording employment or support to no less than 5,000,000 people, and with an invested capital of \$100,000,000.



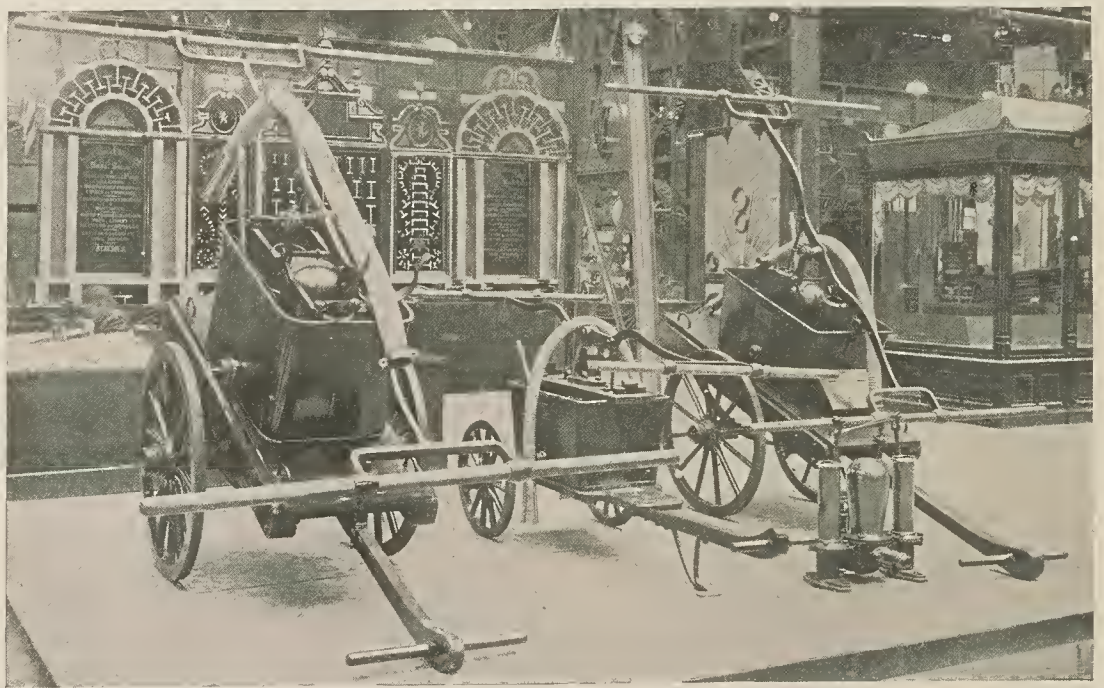
CANADA MACHINERY

First and largest among the eleven groups contained in this section is that which includes motors, and apparatus for the generation and transmission of power. Here is a horizontal compound engine of Manchester make, by which is driven one of the three lines of shafting in the British section. With 70 revolutions to the minute, a boiler pressure of 100 pounds indicates 350 horse-power. Its high-pressure cylinder is supplied with a so-called gridiron expansion valve, operated by a process recently patented, the low-pressure cylinder being placed above it, and with the axis of the former radial to the shaft centre. The governor is in the shape of a parabola, with cylindrical fly-balls, and is connected with, and controls, the rod of the expansion valve, thus admitting steam as required. The workmanship is of thorough English type, solid, substantial, and with the parts so perfectly balanced that the engine runs smoothly and quickly, is readily controlled, and with remarkable steadiness of turning.

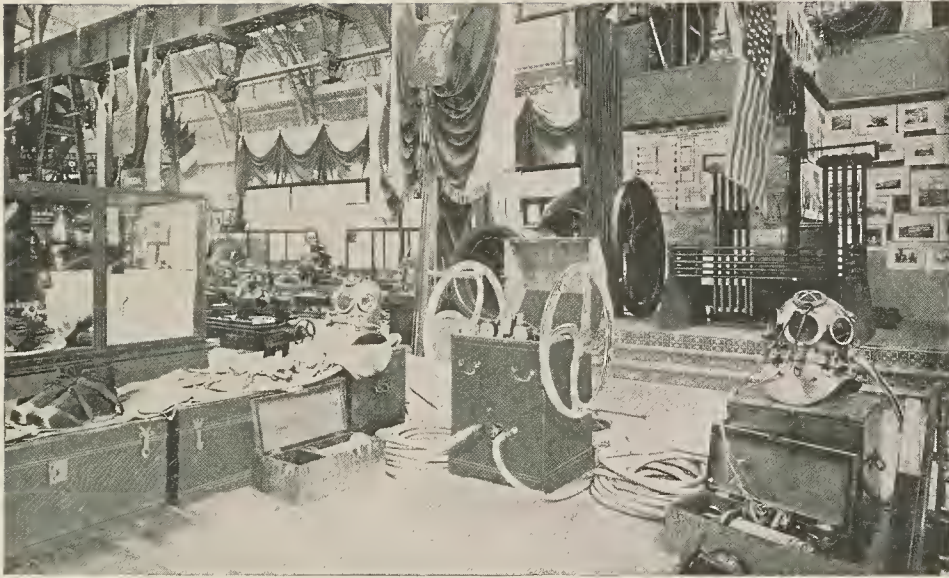
The other lines of shafting are driven by two single-acting central-valve engines, running smoothly and silently, but with remarkable speed, the normal rate



E. P. ALLIS

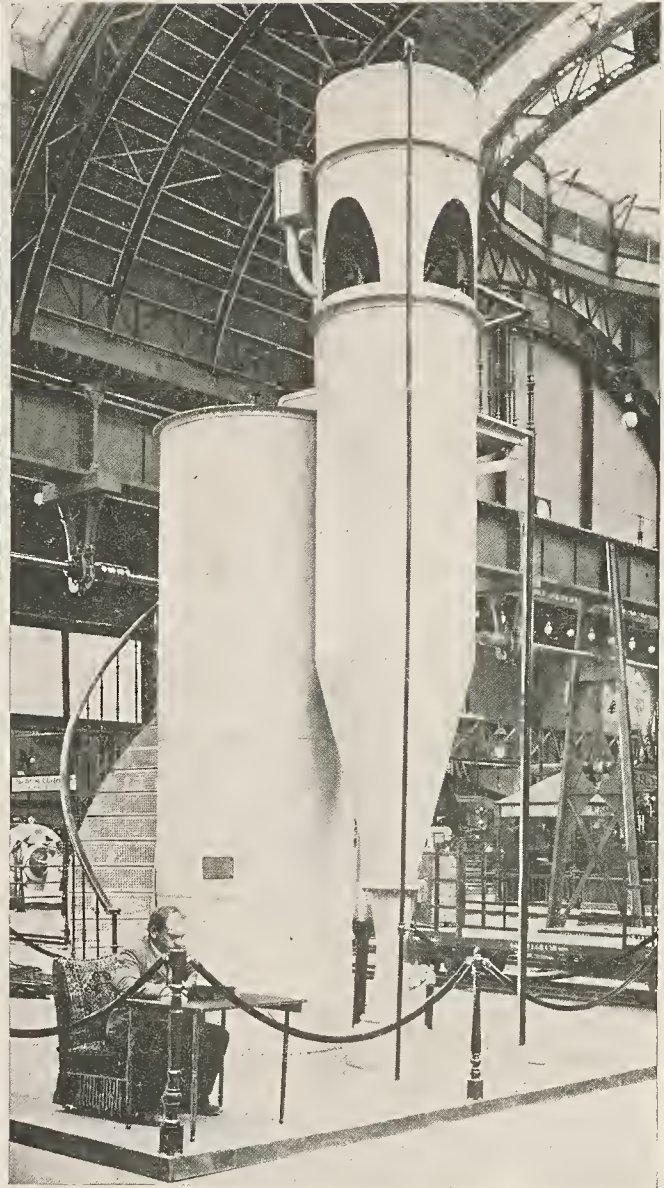


FIRE APPARATUS, BELGIUM

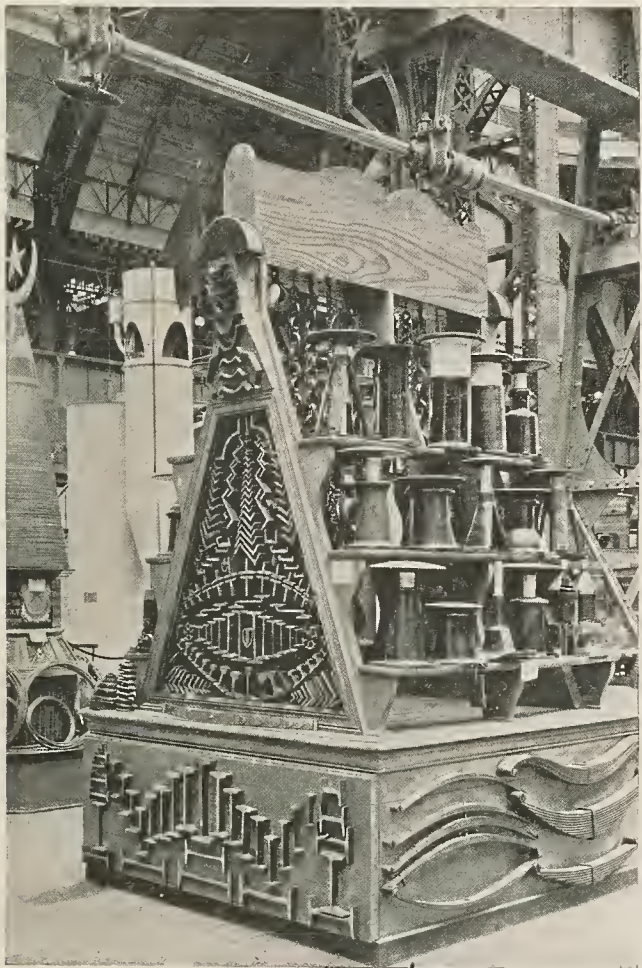


DIVING APPARATUS, RUSSIAN SECTION

exceeding 350 revolutions to the minute. A feature in both is their small consumption of steam, which falls as low as 13 pounds an hour for each horse-power. In connection with this exhibit is a two-pole dynamo, generating electricity, through power supplied by the engine to which it is attached, at the rate of about 85 per cent of the indicated horse-power, the remainder being lost by friction. Here is a fair specimen of an English central station plant, ten of these sets forming the plant now in use at one of the largest London stations. By a Grantham firm is displayed a safety oil engine, in which the usual apparatus for firing the charge is dispensed with, the oil being converted into gas in a red-hot vaporizer. From Dumbarton works are models of quadruple expansion marine engines, now largely used by ocean and channel steamers. Among the exhibits in this group is a dual screw steam engine for propelling vessels, with concentric shafts, and without gear or belting. Worthy of note



WATER PURIFIER, BELGIUM



BELGIAN RAILWAY IRONS

also is a large collection of beltings, including such as are made of slotted steel, leather, rubber, gutta percha, and textile fabrics, with other articles for railroad, military, and mechanical purposes.

Of apparatus for extinguishing fires there is a slender display, as also of machines for working in metal and wood, for lithographing and color printing, and for photo-mechanical and other mechanical processes of illustration, the last contained in the hall of Manufactures and Liberal Arts. Machinery for the fabrication of textiles is better represented, one firm sending a complete set of cotton cleaning, combing, and carding apparatus, and others spinning frames, and looms for cotton, wool, and silk, among the latter several of the Jacquard pattern. Of printing machines



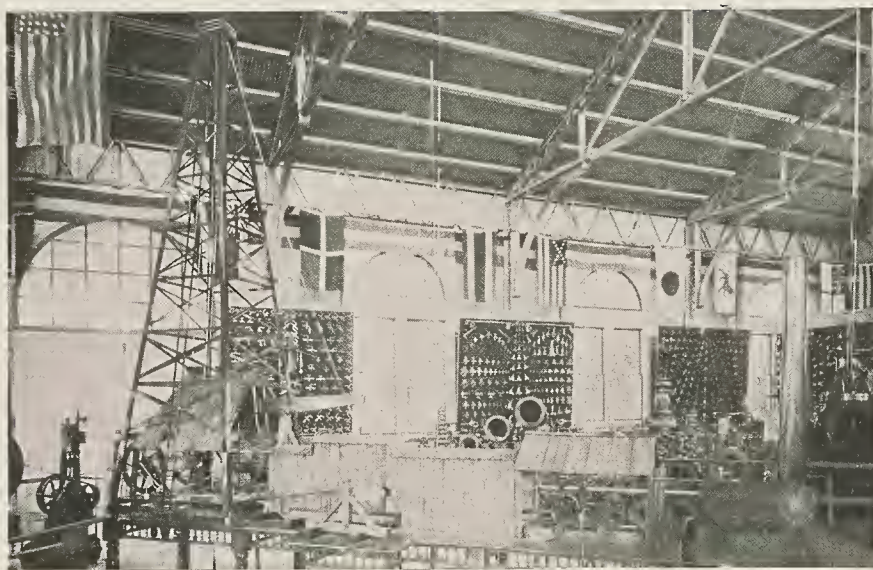
BELGIAN BELLOWS AND FORGE



BURNING OF THE COLD STORAGE BUILDING



OIL WELL DRILLING RIG



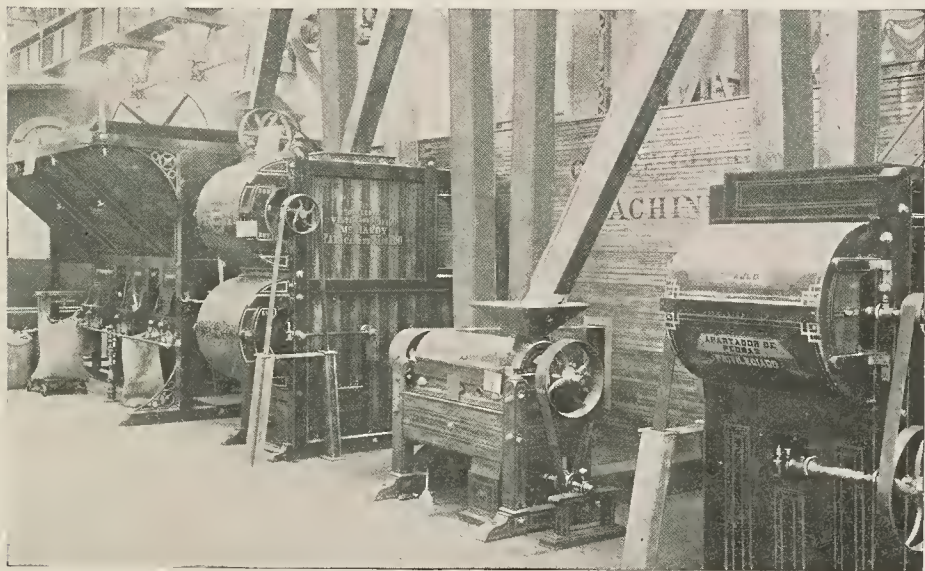
OIL BORING AND DRILLING APPARATUS

there is one which, in addition to its primary use, serves also for cutting, collecting, pasting, folding, and counting, and a London firm displays type distributing, composing, and justifying machines, with racks so arranged as to show the use of apparatus for distributing all the founts of ordinary type, from pica to pearl. A Leeds manufacturer has a machine by which bricks are made at a single operation, and a London establishment shows models of its kilns and ovens for burning bricks, tiles, pottery, and terra cotta ware, with samples of articles so burned. Of machinery for the preparation of food there are several exhibitors, one having a plant complete for bread and

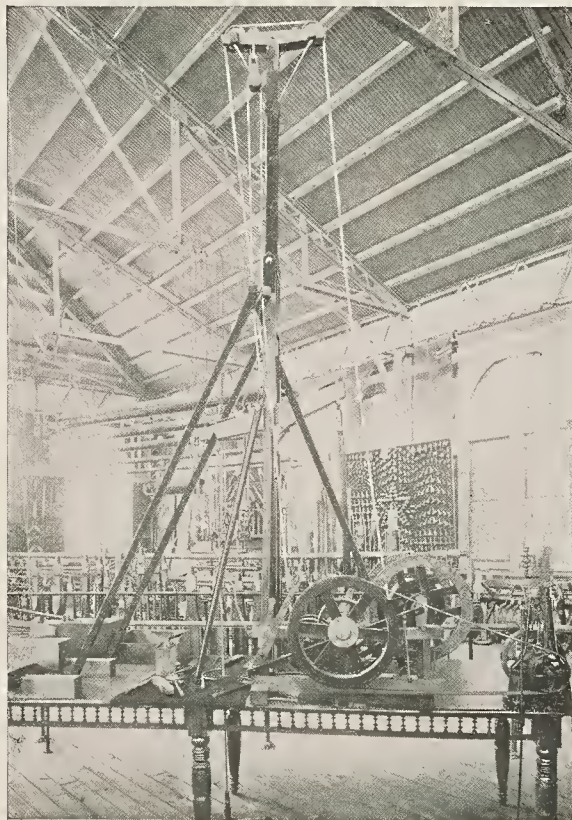
biscuit-making, for pastry, cakes, and confectionery. Finally there is in another group a so-called automatic refreshment stall, such as is used in factories and public streets for distributing light refreshments and temperance beverages.

As with most of the foreign participants, France has no very imposing display in Machinery hall, her exhibits consisting mainly of apparatus for the cutting of glass-ware, the manufacture of confectionery, soap, and candles, the grinding and polishing of lenses, and the making of delicate embroideries. In this section there is no massive machinery, the nearest approach to it being the display of mill-stones by a French quarryman, and a collection of castings and other articles from a firm of engineers and foundrymen. There are also exhibited by the Paris firm of A. Piat and company oscillating portable furnaces, and crucible cupolas, used among other purposes for gun-metal castings, statuary, and machinery bronze work, and ordinary brass castings.

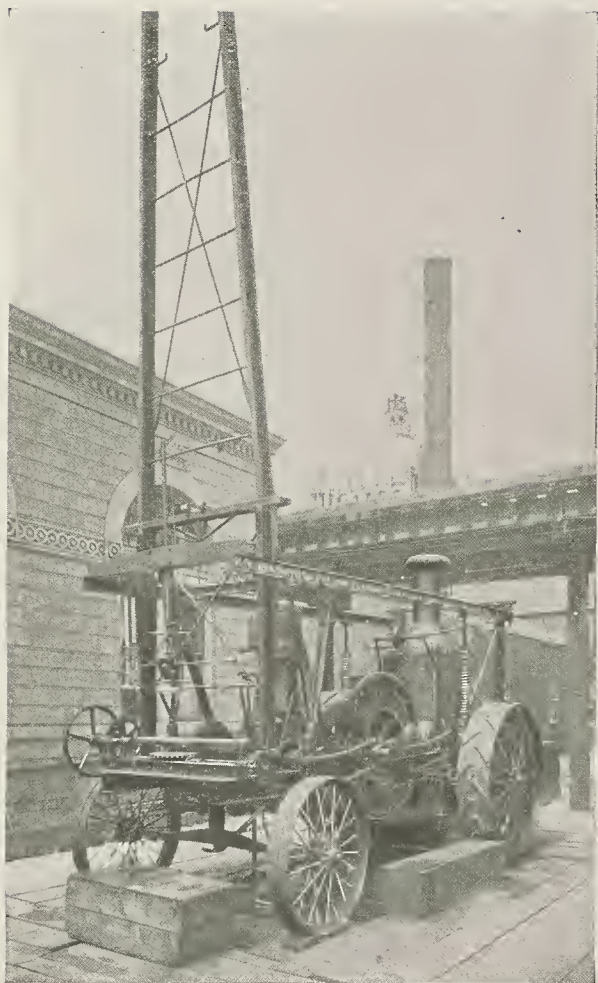
Adjoining the French section, Mexico and Russia occupy small areas, the latter covering about 3,000 square feet. The Mexican exhibit is mainly one of high-speed engines, of no great size, but powerful, and well constructed. Russia has models of her enginery of war, with a collection of petroleum grates and furnaces, charts and drawings from the



COFFEE CLEANING EXHIBIT, BRAZIL



OIL MACHINERY



OIL BORING AND DRILLING MACHINE

company, and consists of specimens of merchantable iron, with plates and curved sheets, and sections of girders, sleepers, and columns. Elsewhere is machinery for making worsted goods and embroideries, ice cream and confectionery. Compared with modern American appliances, the apparatus for extinguishing fires is of somewhat primitive fashion, the fire engines of Liège, reminding one of the American hand machines of fifty years ago.

Near the eastern portico of the main hall is the Canadian section, the exhibits including a collection of small single-valve automatic engines. Here, also, is one of the very few boilers which are not in active use, a straw burning boiler, specially designed for the agriculturists of the sparsely timbered northwest territories. Wood and iron working machinery is well represented in this section, as are also such domestic appliances as washing machines, patent clothes lines, and meat choppers. There are several brick-making machines on exhibition, and the fire engine displayed by the Ontario works will bear comparison with those in the American department.

Southwest of the German section are the small exhibits of New South Wales and Sweden, the chief interest in the former centring in a case of electrotypes presented by the government printing office as samples of its work. A Swedish doctor of philosophy from Stockholm contributes a few dynamos, and an inventor of the same city shows a machine whereby can be made nearly 200 barrels an hour. Adjoining the Swedish section are a few small Spanish machines, including those for raising water, and for

government institute of technology, and illustrations of the course of instruction pursued in the school for sub-marine divers, at Cronstadt. Methods of lighting by electric lamps, and of regulating the breathing of the divers are shown by photographs, and on a table near by is a huge diver's suit of orthodox pattern.

Austria occupies more than 8,000 square feet between the French and Belgian sections. In one of the booths is delicate glassware, much of it adorned with outlines of the Exposition buildings; in another, handkerchiefs, embroideries, and various fabrics. Among machines and appliances are those for making bon-bons, for lithographic work, and protective purposes, and for operating circular saws, while a Pilsen factory displays some specimens of ordnance, a large screw for a steamer, and photographs of armor which has been penetrated by missiles manufactured at its works.

The Brazilian booth, adjacent to the Austrian section, contains an exhibit of coffee cleaning apparatus, contributed by several San Paulo and Campia firms. One machine separates the coffee from the stones with which it may be mixed, the ventilator clearing away the leaves, earth, and other refuse; another hulls the coffee without breaking the kernels or allowing any to escape, reducing the shell almost to powder, which is removed by a connecting ventilator; a third segregates all the black and inferior grains, and allows the coffee to fall into a series of sieves, thus separating it into its several commercial grades.

A considerable area in the eastern portion of the main hall, between the power plant and the British section, is covered by the exhibits from Belgium. The most extensive display is from the works of a large iron and steel



BRITISH SECTION



SHALLOW OIL WELL APPARATUS

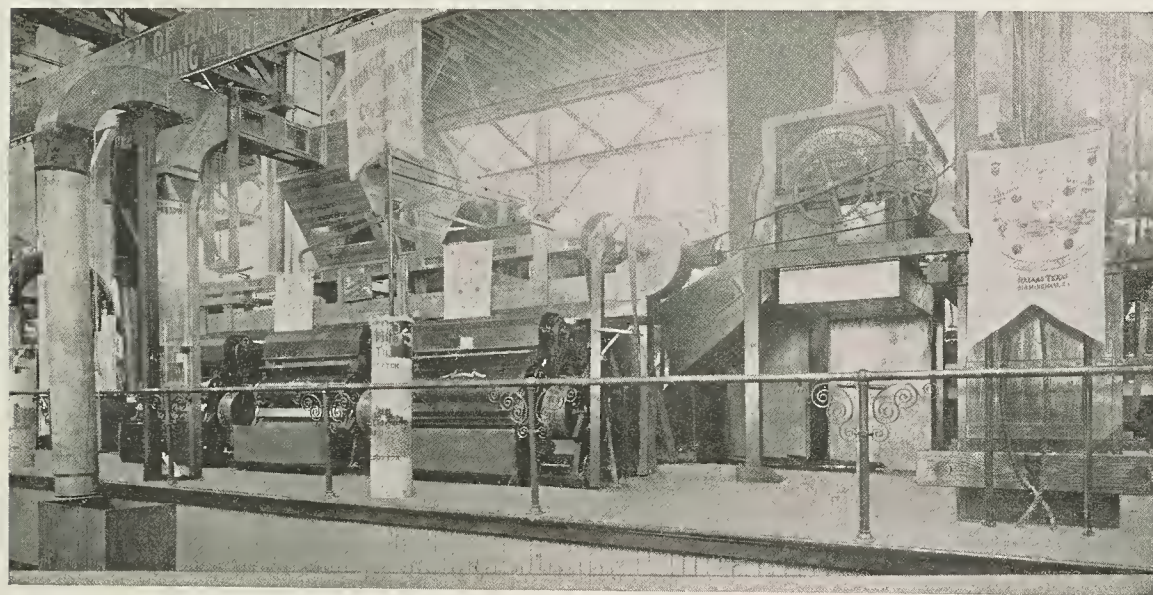
planing. In this vicinity also Switzerland and Italy have minor exhibits, the chief feature in that of the former being a practical illustration of processes of electro-plating with gold and silver. Lenses, embroidery machines, and oil manufactures are displayed in the Italian group.

WORLD'S FAIR MISCELLANY. — Almost while in the act of penning my description of the Cold Storage building and its contents, came their destruction by fire on the evening of the 10th of July, 1893. This edifice was erected by the Hercules Iron company of Aurora, Illinois, and the exhibits, together with the systems which they illustrated, were those of the West Side Artificial Ice company, of Chicago. From the centre of the structure rose to a height of 220 feet a wooden tower, covered with staff, and surmounted by a dome. Here it was, near the base of the dome, that the fire was first discovered. The engines were quickly on hand, and from a narrow

derricks, drilling machines, and tanks are as profusely displayed as in the oil regions of Pennsylvania and Ohio. The centre of these exhibits is a stone building, erected by the Oil Well Supply company, of Pittsburg, outside of which are all the apparatus required for boring and drilling. Within the building, which is decorated with the flags of all nations, are models of machines showing the development of various processes of obtaining oil, with a large collection of pumps in operation, and of fittings and tools used in boring for petroleum and gas. Portable drills for surface wells, and the large machines designed for boring to a depth of about 3,000

feet are shown both as models and originals. In the centre of the building are photographic and other illustrations contrasting the present apparatus of the company with such as was used by its founder thirty years ago.

About 100 feet south-east of the main hall, and a short distance from Michigan's logging camp, is a model saw-mill erected for the purpose of exhibiting, in operation, the most improved machines for transforming lumber into its manufactures, and for keeping machinery in repair. The north-west supplies white pine, the south yellow pine, the west cedar and cottonwood, and other sections many varieties of hard-wood, all of which are made into such articles as shingles, barrels, and boards. About a dozen companies by which are made



COTTON MACHINERY

ledge, a few feet below, the men stood, hose in hand, prepared for action. But at this juncture tongues of fire shot forth near the base of the tower, and a moment later the flames broke out with a smothered roar from every portion of the tower, cutting off the retreat of the firemen. Then followed a scene of horror such as few have ever witnessed. Around this narrow ledge the firemen ran, vainly seeking an avenue of escape. One slid downward on a rope; another on a line of hose; but hose and rope snapped, and the men disappeared in flame and smoke. Some fell, and some threw themselves headlong on the roof, more than eighty feet below; and as the tower parted in the middle, and fell crashing into the burning gulf, the one human being who remained on the ledge was seen to leap into air, and then fall prone into the devouring sea.

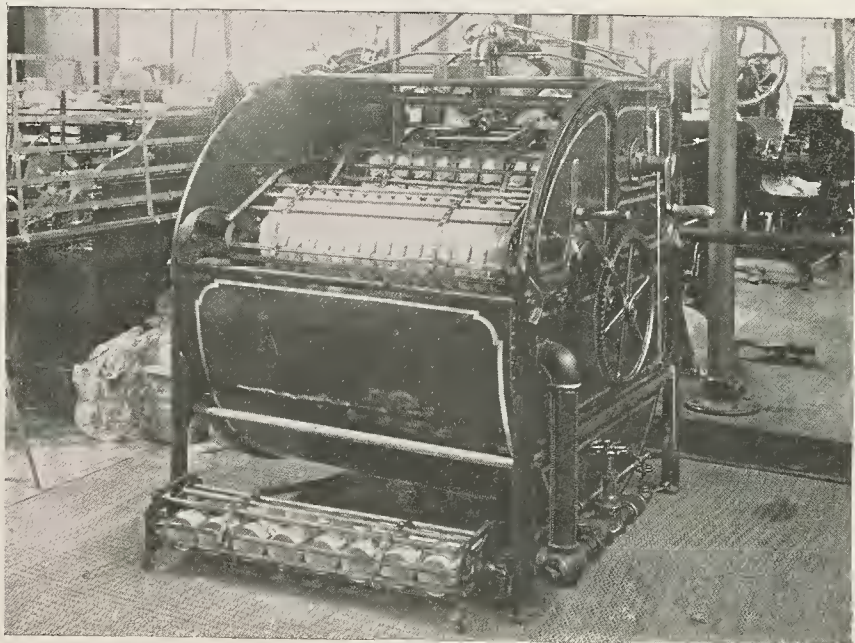
During the investigation of the coroner's jury it was shown that the steel smoke-stack enclosed within the tower was fourteen inches shorter than the structure itself. In the plans, as prepared by the architect, this space was to be occupied by a thimble for the protection of the exposed wood-work; but in the construction of the building this safeguard was omitted, and hence the disaster, with its attendant holocaust, in which seventeen lives were lost. Of the gate receipts of the following Sunday \$25,000 was set apart by the management as the nucleus of a relief fund, and this was swelled by further contributions to nearly \$100,000.

To the Westinghouse Electric and Manufacturing company was awarded the contract for providing the plant by which the buildings and grounds of the Exposition are supplied with incandescent lights, and for this purpose it placed in Machinery hall fourteen machines, with an aggregate capacity of 158,000 sixteen-candle power lamps. In the construction of its system were used some forty-five miles of wire, while the Exposition authorities ordered 250 miles of wire, covered with rubber, or lead, for the completion of the arc circuits. There are also about forty miles of conductors.

Covering a large area directly south of Machinery hall are exhibits connected with the oil industries of the country. Great

the larger machines for working wood, place specimens of their work in the model mill. There are portable saw-mills, jig, and circular saws, log rollers, and all kinds of machines for sharpening and setting saws, with a collection of filing machinery.

As previously noted, the exhibit of road-making machines although included in this department was considerably scattered, some of the rollers being placed in the Transportation building, and



COLUMBIA DISH WASHER

others in the Mining and Agricultural buildings, and the model saw-mill. At times a collective exhibit of these machines in actual operation may be seen near the shore of the south pond, and the Intramural railroad.

The largest boiler in the plant is in the boiler-house extension, and is named the Morrin's Climax. It generates steam equal to 1,500

horse-power, and has a heating surface of 10,000 square feet. The boilers are connected with the oil storage tanks by steam coils, in which the oil may be heated in cold weather. Exhibitors may select for themselves the burner to be used for their apparatus. In some cases the burners and connections are kept behind fire-proof doors, the supply of air passing from the rear to the front of the furnace, where it comes in contact with a spray of oil, and is heated to a high temperature before combustion takes place.

By the Allis engine in Machinery hall was virtually put in motion the entire mechanism of the Exposition. When President Cleveland pressed the electric button, and closed the circuit, an electric valve attached to a four-inch pipe was opened, steam being thus admitted to the engine which, in turn, brought its two great dynamos into play. Near this engine is one of 1,000 horse-power, and with a fly-wheel 28 feet in diameter, belted to a dynamo. All exhibitors furnished with power to operate engines or machinery from the regular plant, paid the department at the rate of \$60 per horse-power for the season, if their machines were run continuously. The amount of power furnished gratuitously was only sufficient to keep a machine long enough in motion to show its workings.

Except by specialists, it is not generally known that wood, granite, cast-iron, and copper, were formerly used in the construction of boilers, the last as recently as thirty years ago. When inventors were called upon to meet the demand of manufacturers for something that would withstand a higher pressure, they were obliged to substitute plate iron and steel, and as we have seen in speaking of the boiler plant of Machinery hall, to distribute the aggregate power generated among numerous tubes, or miniature boilers.

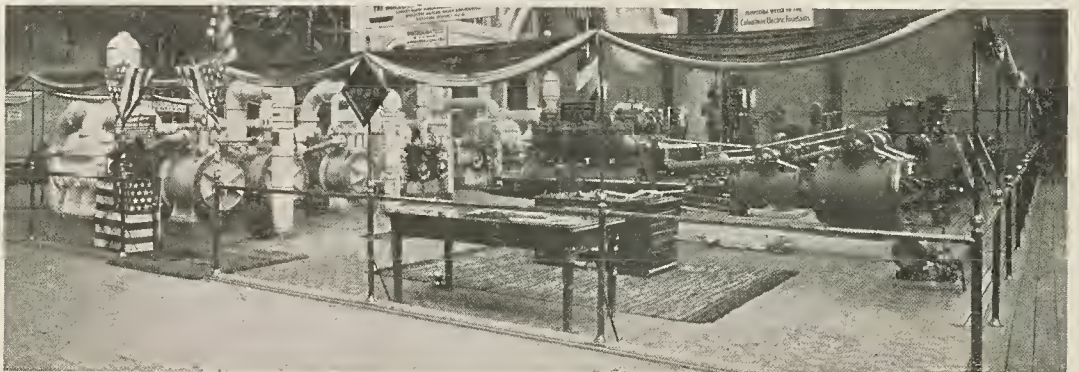
While no great progress has been made within recent years toward increasing the efficiency of steam boilers, there has been a large reduction in the quantity of steam consumed by engines in proportion to their horse-power, amounting probably to 30 per cent within the last score of years. This has been mainly caused by the more general introduction of the compound system, one by no means new, but which, for whatever reason, engineers were slow to adopt. It is to be regretted that no provision has been made in Machinery hall for a comparative test of boilers and engines, for which an excellent opportunity is here afforded.

In the eastern gallery is a black walnut case from which protrude ten levers, and from these pulleys connect with the bells in the tower above, whence their chimes are heard at intervals afar in the grounds. The bells are fastened to a massive oak frame, the heaviest weighing 3,000 pounds, and the lightest, 300. It is stated that the same company which manufactured the first large chime of bells in the United States, more than fifty years ago, furnished the one in Machinery hall.

Among the miscellaneous exhibits is that of the so-called Working-Men's Insurance in the form of a series of tables, or charts. This is from the Imperial Insurance department of the German empire, and intended to bring to the attention of Americans its system of compulsory insurance. Its three funds, providing against accident, sickness, and old age, are contributed from state employers and employes, the payments of each being determined by the aggregate of wages disbursed, and of individual wages received.

Another minor exhibit in the German section is a cigar-rolling machine that makes cigars of every shape, and of which there are many thousands in use. Still another consists of dough-making machines, of a pattern for which it is claimed that more than thirty exposition medals have been received. A special class includes a large assortment of miscellaneous machinery and processes, including such as are used for the reproduction of oil paintings, for polishing plate glass, for shelling grain, and for making syrup out of potatoes. The only mural painting in the German pavilion is on the northern wall above the portal, and represents a longitudinal section of an armored turret for coast defense, constructed by Friedrich Krupp.

Saturday, the 26th of August, was known as Machinery hall day, when was given the first of a series of entertainments in connection with the main departments of the Fair. At nine o'clock, when the great chime of bells rang forth from the tower, the building was already filled, and soon afterward was densely crowded, thousands passing in and out in one unbroken stream. At noon were songs by jubilee singers, and an hour later, diving exhibitions in the lagoon which flanks the Machinery building. First was illustrated the system of telephoning under water, as adopted by the Russian naval school at Cronstadt, the diver, one Assenig Korotaeffsky, encasing himself in a diving suit, weighted with lead, and, as he sank and emerged from the water, suggesting that a new species of sea-serpent had been added to the World's Fair exhibits. Then came a pitched battle between crews selected from the boiler and engine-rooms, attired in bathing suits, and placed on board scows forty feet apart. Both were



WORTHINGTON PUMP EXHIBIT

supplied with hoses to which a pressure of eighty pounds was furnished by Worthington pumps, and at a given signal the fight began, victory declaring for the crew that should knock its opponents overboard into the lagoon. The captain of one of the boats weighed about 300 pounds, and as he stood grasping his hose, arrayed in a close-fitting suit with alternate stripes of black and red, his appearance was greeted with roars of merriment. After a brief but spirited contest, his men were worsted, and their scow began to sink, the fat man betaking himself and his 300 pounds to shore as best he could. This was followed by an aquatic contest between two companies of so-called royal horse marines, with brooms as weapons, and steeds in the shape of barrels, sufficiently weighted, and with imitation heads and tails. After this was a greased pole performance, several competitors for the prizes which hung at its end, suspended over the pond, receiving instead a fresh water bath, among them the fat man, who, after a futile attempt, plunged, like a porpoise into the lagoon. Other diversions followed, accompanied with music, and special exhibits of machinery in motion.



CHAPTER THE THIRTEENTH

AGRICULTURE



THE Agricultural building is among the most sightly of the Exposition palaces, its chaste and serious design, its wealth of decorations, and richness and variety of detail, making it one of the most refined and luxurious homes of industry that welcome this gathering of the nations. Fronting on the main court 800 feet, with a depth of 500, and with its eastern façade almost touching the waters of the lake, this structure occupies, apart from its annexes, a space of some nine and a half acres. Built with a careful regard to its effect on adjacent edifices, it was planned in such fashion as to secure the best disposition of its contents, together with the lighting needed for a comparison of the agricultural products of our own and foreign lands, between many of which their delicate shades of distinction cannot be readily detected.



SIGN OF THE ZODIAC

After considering their plan, the New York firm of architects by whom was designed this temple of Ceres, decided to erect their main building around a hollow square, divided in the centre by two open naves intersecting at right angles, and on their sides two-storied aisles, with longitudinal passage-ways through the four courts into which the floor is thus divided. Passing between the Corinthian pillars at the principal entrance, more than 60 feet wide, the visitor enters a vestibule profusely adorned with statuary emblematical of agriculture and agricultural pursuits, the vestibule leading into a rotunda, 100 feet in diameter, and surmounted by a glass dome 130 feet in height. At the top of the building and around it is an arcade, and at the corner are pavilions, also with domical treatment. The edifice is fashioned after the style of the classic renaissance; portions of its walls are painted with allegorical figures, and on the outer sides, as well as in the interior is a luxury of pictorial, sculptural, and other artistic ornaments, relieving the stateliness of the design.

While none but the most captious among the pilgrims of the Fair will be disposed to find fault with this structure, in itself a well-nigh perfect work of art, it has been objected, and not without reason, that nearly one half of the space was devoted to aisles and other passage-ways. To the distribution of that space exception has also been taken; but by the artificers and managers these apparent defects are explained through considerations that need not here be mentioned. To Great Britain were allotted more than 13,000 feet, and to France, a greater agricultural country, only 7,000 feet. Australia has 8,600 feet, while to such great agricultural states as Kansas and California, both with a much larger volume and variety of agricultural production, only some 2,000 feet were awarded. Russia has 9,500 feet, and Italy and Spain but 3,000 or 3,500 feet for each; but in all cases the allotment of space has been regulated rather by the character and extent of the display than by the agricultural output of the territorial divisions here represented.

Adjoining the Agricultural building is a large annex, near one of the stations of the elevated railway, and of which a portion is used as an assembly hall, and as a common meeting ground for persons engaged or interested in agricultural and stock-raising industries. On the ground floor is a bureau of information, where



ABUNDANCE, MARTINI



AGRICULTURAL BUILDING

are attendants whose duty it is to give to visitors such knowledge as they may desire, not only concerning the hall and its purposes, but as to the main building and its contents, with other portions of the Exposition. Here and on the second floor are waiting-rooms and apartments suitable for committees and associations, whose secretaries are always at hand.

In none of the homes of the Fair has sculptural and pictorial embellishment been more happily blended with architectural design. Above the gilded dome is poised St Gauden's gilded statue of Diana, appearing to better advantage as thus transferred to its lofty pedestal, from the Madison Square garden in New York. Over the corner pavilions are Martini's figures of the races, in four groups of colossal female forms, supporting mammoth globes. All are identical in pose, and it is said, produced from a single mould, a different head being placed on each of the models. On the pediments of these pavilions are groups by the same artist, representing a shepherdess with her flock, and a shepherd with his dogs, all in his happiest style. Other of his contributions are those which portray, in classic symbolism, the signs of the zodiac and the emblems of abundance, the fluted drapery of the latter concealing their opulence of form, some holding under their wings the horns of



THE FOUR RACES

plenty, and others with tablets on which are inscribed the names of products emblematic of the seasons. Still another of his groups is typical of agriculture, the tall impersonation of that industry rising above the branching horns of oxen, yet in perfect symmetry and poise. Over the principal entrance is a statue of Ceres, by the Florentine artist, Larkin J. Mead, who parted with his treasure somewhat reluctantly, and only because, as he remarked, it would reveal to our American artists what sculpture really is.



Let us hope that his brethren of the craft have laid the lesson to heart.

The decorations in graphic art are by George W. Maynard, of New York. At one side of the main entrance Cybele is seated in her chariot, drawn by lions, and on the opposite side, in a car to which winged dragons are yoked, is King Triptolemus, sent forth by the mother of the gods to instruct all the nations of earth in the science of agriculture. Between them are allegorical figures set in a framework of grain and fruit. At the corner pavilions are figures emblematic of the seasons, and on the friezes above, those of domesticated animals.

In the department of agriculture are included not only the fruits of the soil in the shape of food and forage plants, but all the articles manufactured from those products, whether in solid or liquid form. Thus in one group we find bread and biscuits, starches and pastes; in another, sugars and syrups; in a third, malt and



SECTIONS OF AGRICULTURAL BUILDING



PANEL, DANCING GIRL, MAYNARD

alcoholic liquors, wines being represented in the Horticultural division. Here also are meats, smoked, salted, canned, or as extracts, and in a separate structure, the products of the dairy. Agricultural machinery, implements, and processes are fully represented, with fertilizing substances, both animal and mineral. There are farm buildings, models, methods, plans, and statistics, and classed in this division, though housed elsewhere are exhibits of Forestry, and all that the forest supplies.

To the residents of the several states of which Chicago is the main centre of distribution, and supply, the Exposition has no more attractive features than its Agricultural and Live-stock departments, the latter presently to be described. Of the entire grain receipts of that city, valued for 1892 at about \$150,000,000, from eighty to ninety per cent is shipped to domestic and foreign markets, where also is forwarded either on hoof or as meats and lard, as hides and wool, the bulk of its live-stock consignments, representing for the same year a valuation of more than \$250,000,000. The region tributary to Chicago, including,



GROUP BY MARTINI

as it does, a wide section of the western and middle states, is largely devoted to agriculture and stock raising, furnishing indeed a very considerable proportion of the food supply of the world.

In all the United States there are probably not less than 10,000,000 persons engaged in various branches of agriculture, while each one so engaged supports on an average at least two other persons. Thus it will be seen that nearly one half the population of the republic is directly dependent on agriculture for a livelihood, the



PANEL, CYBELE, MAYNARD

number actually employed far exceeding those engaged in all other fields of labor. Add to this the part that agriculture plays in our commerce, our manufacturing, shipping, railroad, and other interests, and it probably surpasses in economic, if not in money value, all other productive industries combined. While in some directions, and especially in cereals, over-production has been followed by a heavy decline in prices, leaving but the smallest margin of profit, and in unfavorable years a positive loss, the more intelligent farmers have fully held their own, many of them raising a variety of products, and with special regard to present and prospective demand.

In no country in the world are there so many farms of considerable size held and worked by individual owners. If in France, Belgium, and a few other countries, there is, in proportion to population, a larger number of proprietary farmers, the average of their holdings is by comparison almost infinitesimal. Of the 600,000 or 700,000 Belgian farms, for instance, nearly one-half do not exceed ten acres; many have less than five acres, and instances are not rare where a family is supported on a single acre. Of the 5,000,000 farms under cultivation in the United States, at least 3,500,000 are worked by their owners in holdings of from 50 to 500 acres, and of farmers with more than 500 acres there are more than of those with ten-acre patches or less. Of tenant farmers there are about 500,000 who pay a money rental, and perhaps twice that number whose rent consists of a certain portion of their crops.

Of the entire area of the United States, less than one-half is included in its farms, and less than one-third is under actual cultivation, the remaining half still containing fertile tracts, though most of it consists of grazing lands, of water surfaces, of mountain ranges, and of the desert lands west of the Rocky mountains. Meanwhile the more valuable portions of these lands are being absorbed under the provisions of the homestead and timber

acts, located with scrip and warrants, or selected by railroads, at the rate of 15,000,000 to 20,000,000 acres a year. In other words, a territory almost as large as that of New England, excluding the single state of Massachusetts, is being segregated every twelve-month from that which is left of the national domain.

During the five years ending with 1892, the United States produced an average crop of more than 3,000,000,000 bushels of cereals, maize ranking first as to volume and value of production, and next, in the order named, oats, wheat, barley, rye, and buckwheat. In 1892 the acreage under cultivation was somewhat smaller than in 1888, and with a more considerable



SYMBOLICAL GROUP



QUADRIGA ON PERISTYLE



MARTINI'S AGRICULTURE

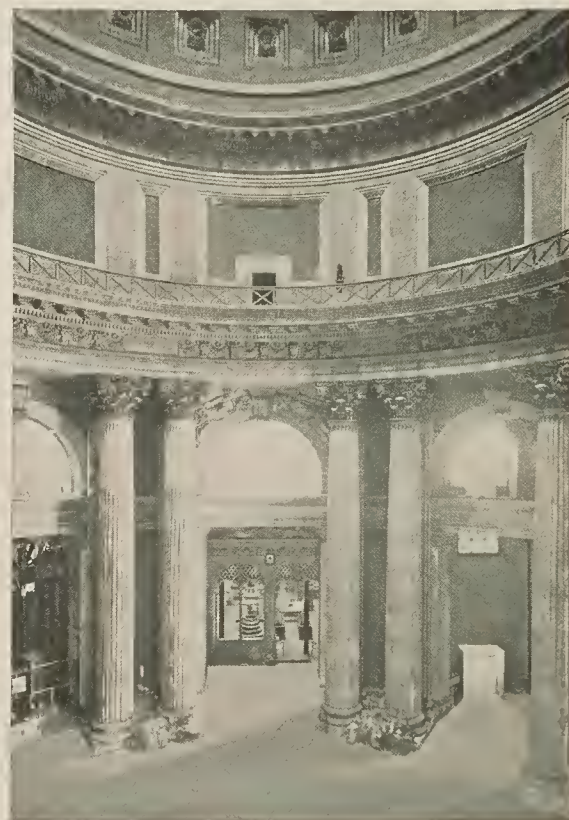
reduction in yield. The best of the intervening seasons was in 1891, when from 142,000,000 acres were produced 3,400,000,000 bushels, worth \$1,600,000,000, or an average of 24 bushels, but with a money value of less than \$11 to the acre. For the following year the total crop fell to 2,800,000,000 bushels, and the average to 20 bushels, with a slight reduction in acreage, and proportionate returns. Of wheat there were produced in that year 516,000,000 bushels; of maize, 1,628,000,000, and of oats, 661,000,000 bushels, with acreages of 13, 23, and 24 bushels respectively. Considering the low prices then prevailing, and the still lower rates current during the following harvest season, it will be seen that except on a large scale, and with the most improved of labor saving appliances, the production of cereals is no longer a profitable industry.

Of hay there were produced, in 1890, some 40,000,000 tons from about as many acres; of cotton, 7,400,000 bales from 20,000,000 acres; of flax, 10,250,000 pounds of seed, and 240,000 of fibre from 1,300,000 acres. Of tobacco the average production may be stated at 500,000,000 pounds; of rice, one-fourth of that quantity, and of

cane, beet, sorghum, and maple sugar, 400,000,000 pounds, or little more than ten per cent of the consumption; for the United States is a great sugar consuming country, using at least 60 pounds a year per capita of its population. Such are in brief the recent annals, and the present condition of leading agricultural interests as repre-



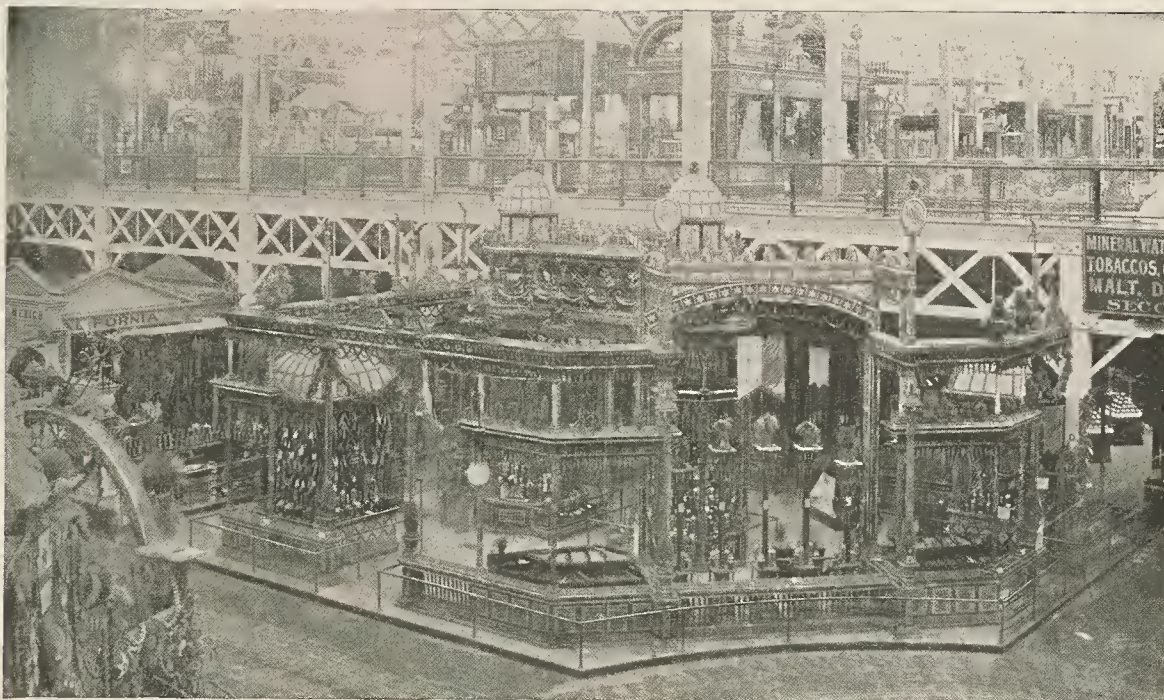
VIEW FROM NORTH GALLERY



ROTUNDA

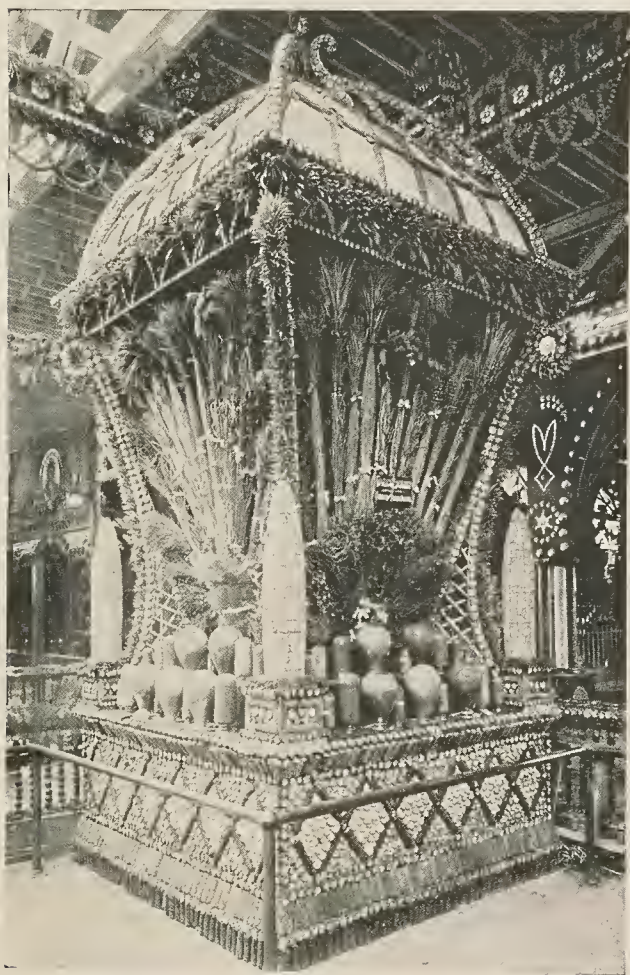
sented at the Fair, and nowhere can be compared to better advantage the products of the great food-producing sections of the republic, and these again with the products of foreign lands.

Between the annex and the central transverse nave of the main hall are the exhibits of the various states, of the American agricultural colleges, and experimental stations, and several minor foreign countries. Fronting on this nave are the pavilions of the leading agricultural states, including Iowa, Illinois, Ohio, Indiana, Minnesota, Wisconsin, Michigan, Nebraska, New York, Pennsylvania, Kentucky, and North Carolina. Iowa occupies a central



IOWA PAVILION

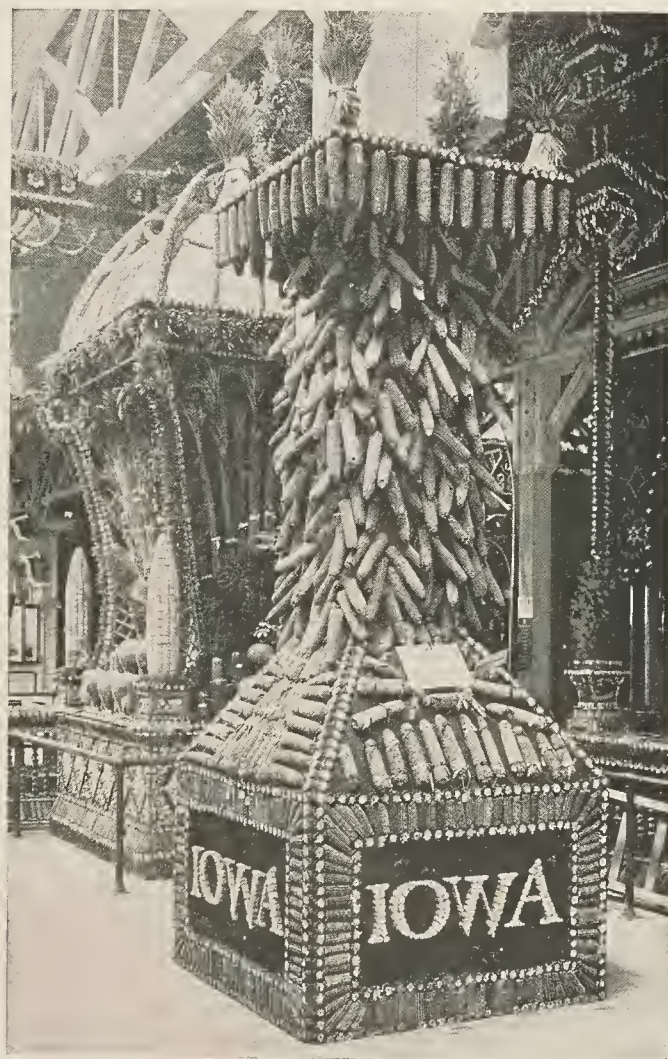
position among the sisterhood, and one in perfect keeping with her geographical position. In her palace of corn, built in the Pompeiian style of architecture, are contained more than 130 varieties of grain. In front is a railing formed of long glass tubes, filled with samples of her soil, the caps above them composed of grains and other products. Red, white, and blue corn decorate the arches and pillars of the interior, in imitation of mosaic work, and at the base of each column are wisps and sheaves of grain. The pyramids within the palace, and the domes which surmount it, are artistically fashioned of corn cobs, kernels, and husks, while the less attractive exhibits, but those which better illustrate the cereal wealth of the state, are classified and arranged as grain in and out of the ear. The pavilion covers an area of more than 2,000 square feet, and aptly represents a form of industry in which at



IOWA EXHIBIT

least two thirds of the exhibitors are engaged.

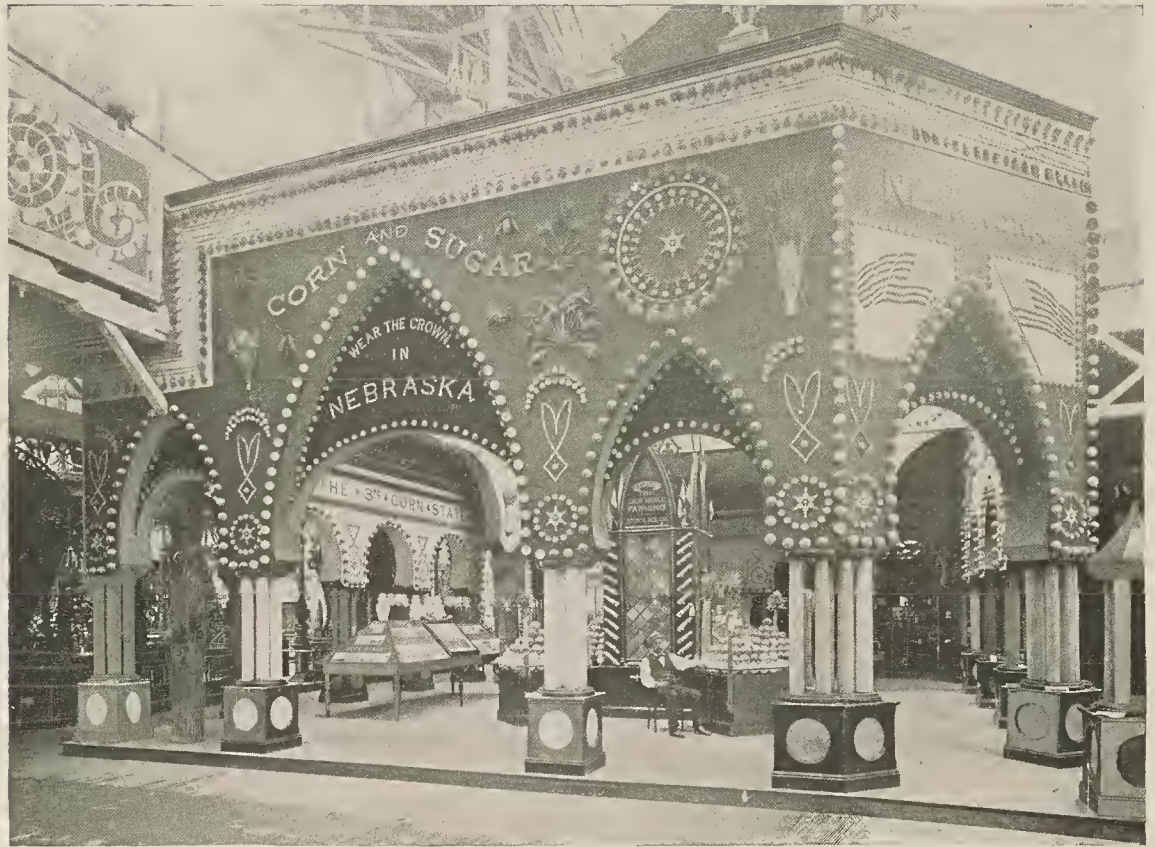
The pillars which support Nebraska's spacious pavilion are filled with her corn, wheat, and other grains, the first of these products being most extensively used in the decorations. One of the most important of her industries is the raising of corn for the manufacture of brooms, and these household articles are fashioned into several unique designs. In the centre of the Michigan section is a Corinthian temple, surmounted by a shield bearing her coat of arms. Above the main entrance is represented a family group, fashioned in corn and wheat, its four members on their way to the harvest field. The exhibits come



IOWA EXHIBIT

from all portions of a state whose surface and soil are greatly diversified, and hence are of a miscellaneous character, including wheat, corn, oats, rye, peas, beans, buckwheat, timothy, and clover, with many varieties of seeds, nuts, and vegetables, and a small display of melons.

Wisconsin's oaken pavilion, whose sides are formed of glass compartments for the display of cereal products, is typical of that substantial and prosperous state, while in the grouping of different grains in beautiful designs, and the decoration of the pillars and roof with the fruits of her soil are expressed the artistic tastes of one of the most cultured of western communities. There



NEBRASKA PAVILION



NEBRASKA EXHIBIT

are also photographs of model farm buildings, and of rural scenes, with a series of colored maps contributed by the chief of the weather service, representing climatic changes and conditions. The exhibit includes; in nearly 1,000 classes, all grades of wheat, corn, oats, barley, rye, buckwheat, peas and beans, with seeds of many varieties, as flax, timothy, red top, blue grass, millet, caraway, and clover, with hops, German vetches, and sorghum, and with grasses and forage plants of more than sixty kinds.

Heads of grain and native grasses form the appropriate materials of which largely consists the decorative scheme of the Minnesota pavilion, planned in a series of arches, and with pillars festooned in cereal and floral designs. Its chief ornament is the octagonal tower upon whose panels are pictorial effects in wheat and grasses, emblematic of the history and resources of the state. Among the grains, which are displayed in jars barley is a prominent variety, for in Minnesota a strong effort is being made to encourage the raising of this cereal for consumption by Canadian maltsters.

Facing the south-eastern section of the rotunda is Pennsylvania's exhibit, housed in a structure whose base is of many colored corns arranged

in geometric figures, with wreaths and borders of feather-like grasses. The roof and entrance are also decorated with designs in wheat and corn, while above all its rich display is a bust of William Penn, calmly surveying the agricultural evolution of by-gone ages. On one of the panels are reproduced the arms of the state—two sturdy farm-horses, one of them in its harness, with a shield surmounted by an eagle, and the well-known Pennsylvania motto, Virtue, Liberty, and Independence. On either side are panels covered with green moss, and serving as a

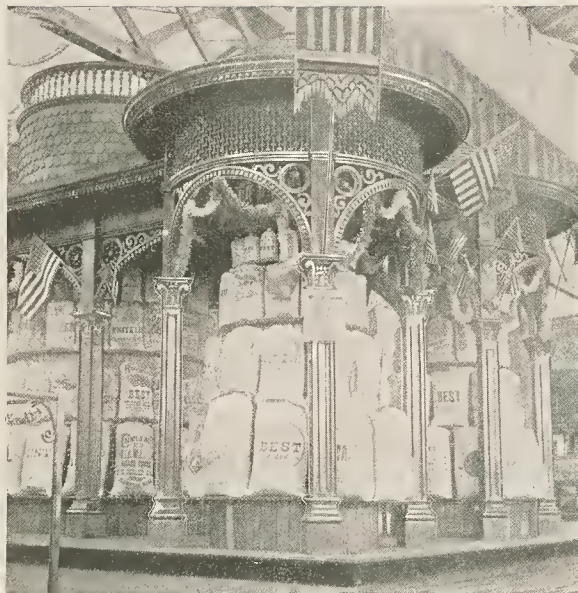


MICHIGAN'S SECTION



background for a group of agricultural implements adorned with ribbons, and wreaths of grass. Above the coat of arms is a keystone, fashioned of kernels of white and yellow corn. The keystone in truth is omnipresent, and in every conceivable design, so that never for a moment is the visitor allowed to forget that this, the so-called keystone state, is the one which held together the sections of the union in their hour of sorest trial.

With its quaint and yet tasteful embellishment, its old-fashioned fireplace, where the



FLOUR EXHIBIT, MINNESOTA



PENNSYLVANIA PAVILION

In a choice collection of photographs are represented Pennsylvania farm-houses of ideal type, embowered in orchards, and overlooking fertile fields. Tasteful and homelike are these habitations, some of them, though almost coeval with the declaration of independence, showing no signs of decay. Worthy of note also are the charts and handsomely bound agricultural reports, in which is a statement of the agricultural and mining products, and the commerce of Pennsylvania as compared with the sisterhood of states.

Next to the Pennsylvania collection is the pavilion of Illinois, one of the most ornate in the American section, though sharing the honors with other structures, and especially with that of Iowa. A commendable

old-fashioned fireplace, where the chimney-piece, the chimney ornaments, and even the andirons are made of corn, the pavilion, with its wealth of decoration, forms of itself a more interesting display than its contents can possibly be. Among the latter are grains, grasses, and seeds in many varieties, with specimens of hops, and a case filled with tobacco in the leaf. An interesting exhibit is that of the Woman's Silk Culture association, whose headquarters are in Philadelphia. In the form of an illustration is the silk-worm feeding on the mulberry leaf, and near by are glass jars filled with cocoons, and bundles of raw silk, and spools of sewing silk, the latter in every shade of dye. Adjacent to this group are rich silken fabrics and festoons of flags draped around a goodly array of diplomas from prominent agricultural societies.



PENNSYLVANIA SEED AND GRAIN

feature, and one that is lacking in many portions of Agricultural hall, is its plentiful supply of comfortable seats, thus making it a favorite resort for tired visitors. There are four entrances to this pavilion, and in its centre is a corn pagoda, its base composed of jars of grain, and aptly representing one of the leading industries of a state whose crop of maize has averaged for a score of years more than 200,000,000 bushels. In glass cases set into the walls are numerous specimens of cereal and other produce, the several groups including many kinds of grain, grasses, and forage plants.



COAT OF ARMS, PENNSYLVANIA



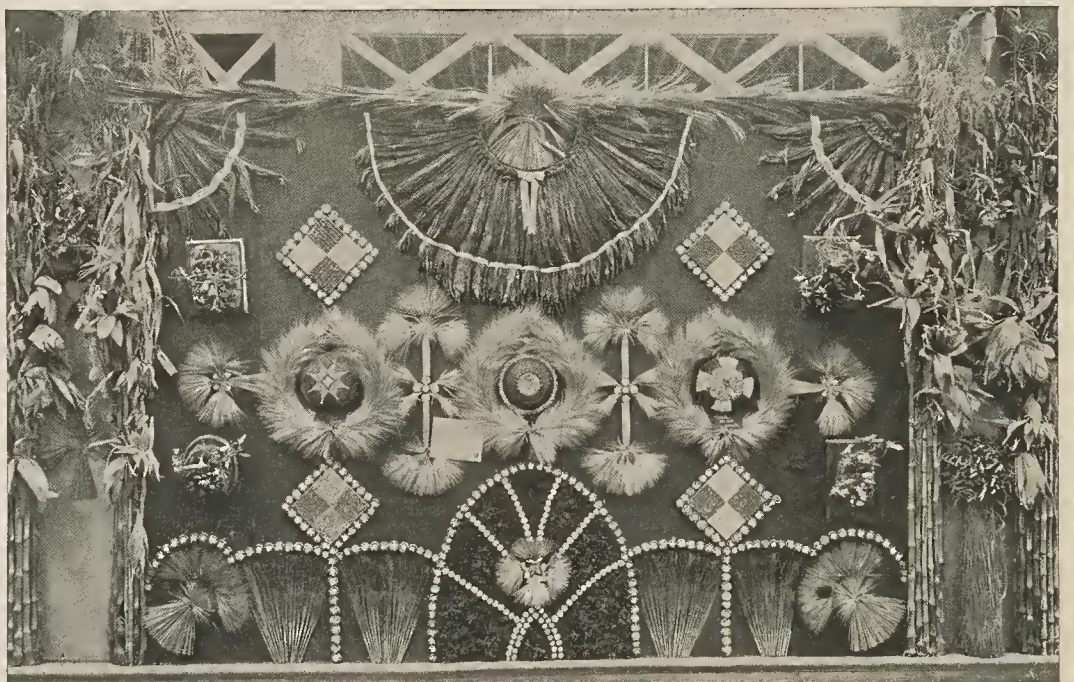
GRAIN AND SEEDS, PENNSYLVANIA

Two of the groups consist almost entirely of vegetables and broom corn; a third of sorghum, and sugar-cane; a fourth of tobacco, hops, and peppers, and a fifth of hemp, flax, and cotton. Worthy of note is the variety of articles displayed by single exhibitors, many of whom show, side by side, their samples of wheat, corn, oats, barley, rye, buckwheat, grasses, and forage plants, thus illustrating their diversity of products, for the Illinois farmer, like the Illinois merchant and manufacturer, is fully abreast of the times.

In structural design the Ohio pavilion resembles somewhat a Roman temple. The

glass columns which surround it are filled with cereals so arranged as to present a pleasing color effect; the cornice is also composed of glass compartments, through which the grains of Ohio are exhibited in all their variety and richness, and on the walls in various receptacles, or in the form of interior decorations, are 130 varieties of wheat, 128 of corn, 37 of oats, and 102 of grasses, with a creditable display of beans and tobacco. In the centre is an office with reception room, in which is a collection of standard works on agriculture.

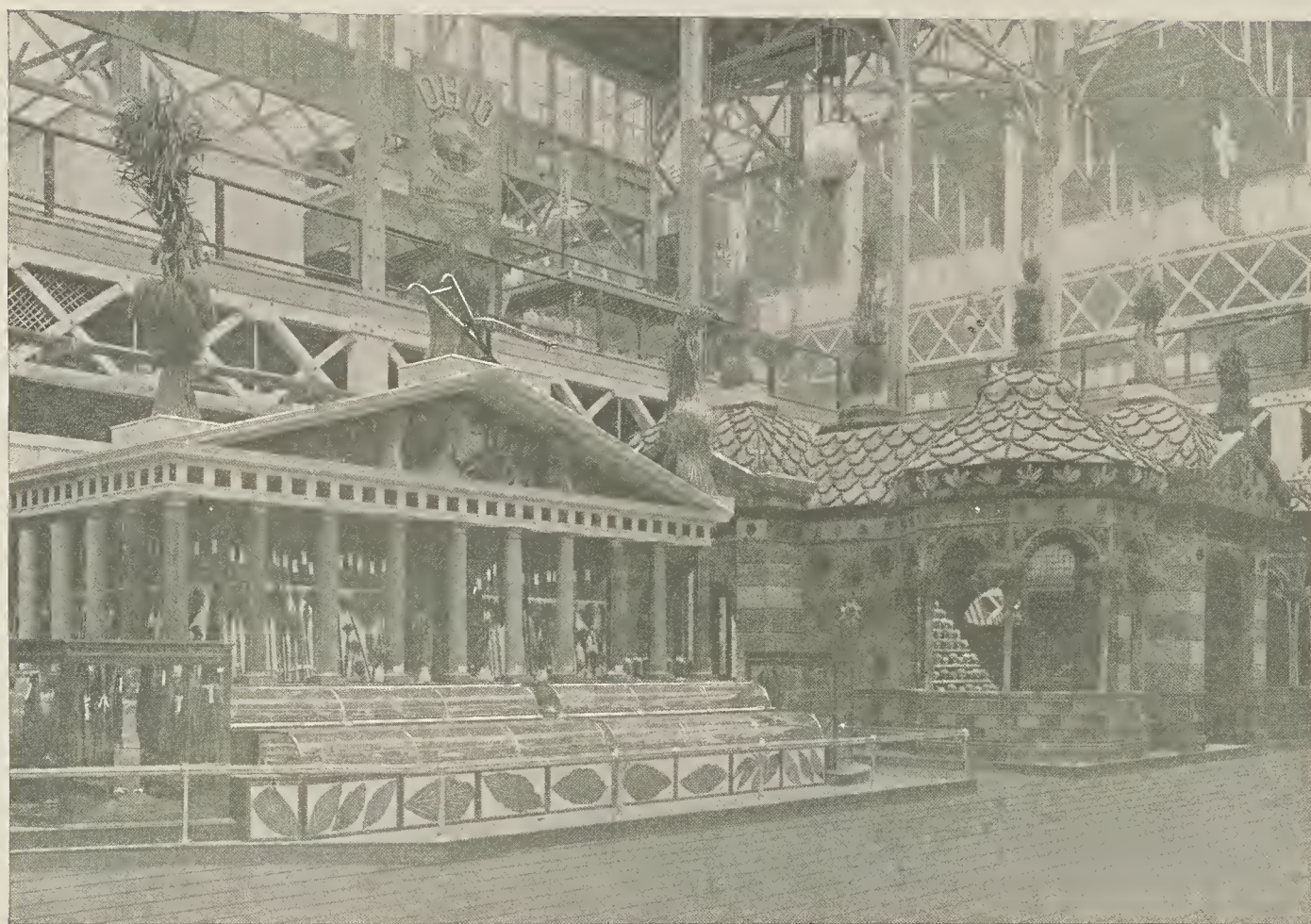
In Kentucky's pavilion leaf tobacco, corn, wheat, hemp, grasses, and blue-grass seed form the bulk of the exhibits, all of which are



ORNAMENTAL DESIGNS IN GRAIN AND SEEDS, PENNSYLVANIA



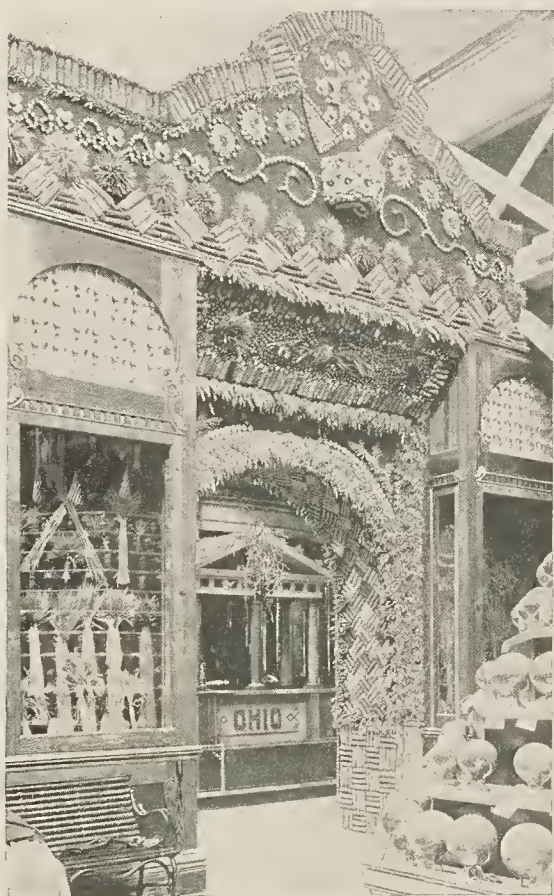
THE COLONNADE



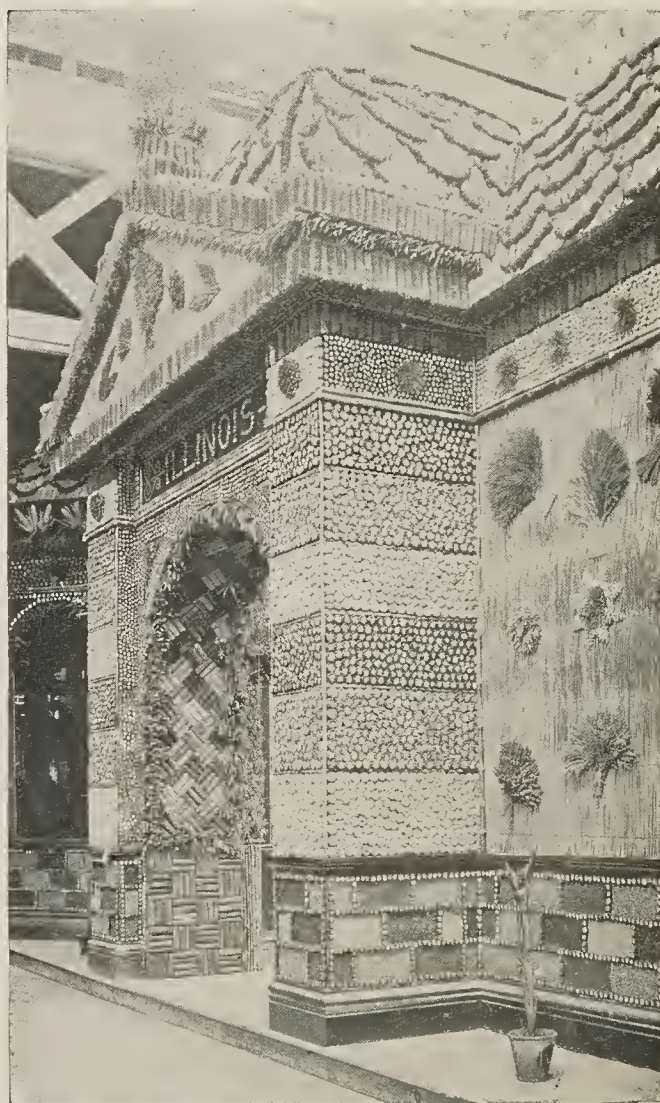
OHIO AND ILLINOIS PAVILIONS

worked into structural forms or otherwise skilfully arranged. Of the three groups under which the collection is classified the largest consists of tobacco, of which there are more than a hundred exhibitors, the description known as Burley leaf being repeated in several score of specimens. Indiana, whose section lies east of the Kentuckian group, is liberally represented, as befits a state which ranks among the foremost in volume and quality of cereal products, displaying also many varieties of grasses, hay, and seeds.

Indiana's exhibits are installed in a pavilion of white, the section fronting the façade being decorated with corn in the ear, and grain in the straw. Within there are three large structures, covered with jars filled with the cereals of the state, a shaft of corn, not unlike an Egyptian needle, rising above them all. In cases are other specimens of wheat and oats in the stalk, collected by the head of the agricultural experiment station, of Purdue university. An artistic



SECTION ILLINOIS PAVILION



ENTRANCE, ILLINOIS PAVILION



SECTION OF THE MISSOURI EXHIBIT

feature is a large wreath of artificial flowers on one of the cases, made by a woman from many varieties of grain and nuts, and containing also a grasshopper, bee, beetle, guinea egg, pinching bug, and the tusk of a hog. To the Indiana exhibit the weather bureau contributes several maps, showing the precipitation, temperature, and rainfall within the state for a period of twenty-two years, and elsewhere are maps presenting data as to altitudes, drainage,

live-stock, and agricultural products.

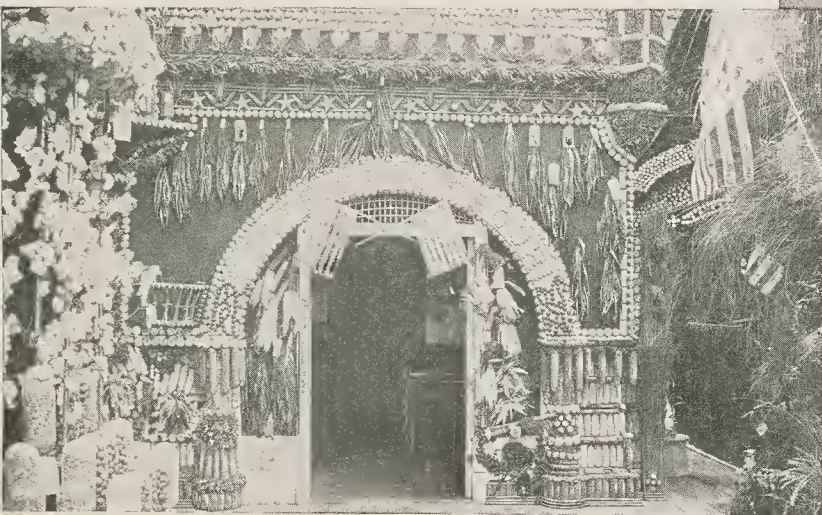
The home of the empire state, somewhat out



MISSOURI CEREALS

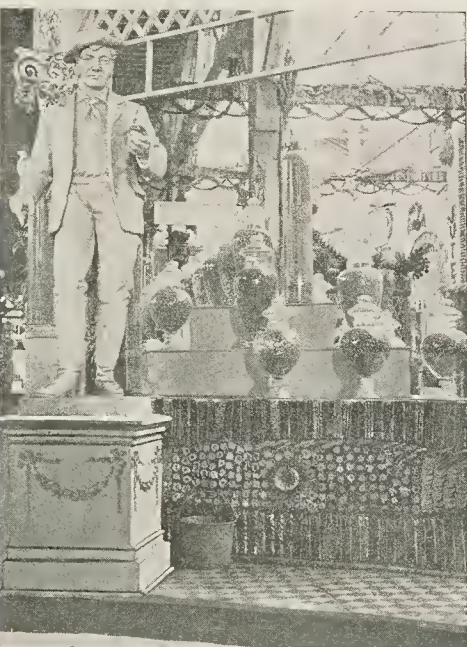


THE BRIDGE, MISSOURI PAVILION



ENTRANCE, MISSOURI PAVILION

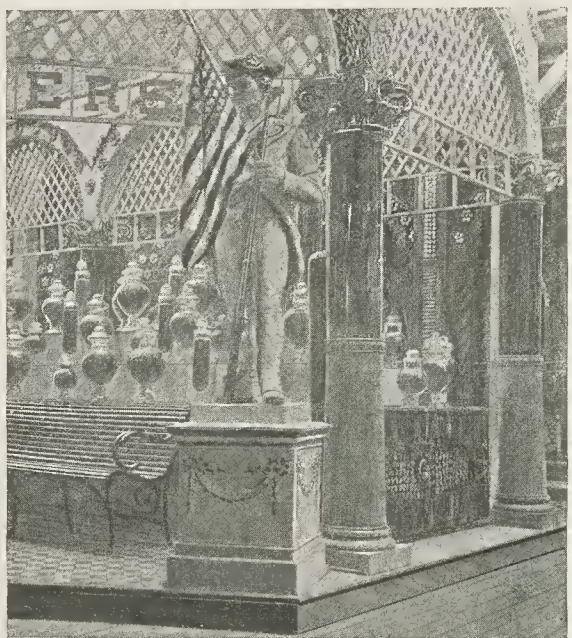
of place, as it would seem, among the western and southern exhibits, is a plain, unpretentious structure, almost severe of aspect; but in the several groups and several hundred classes contained therein is one of the best and largest collections in Agricultural hall, arranged with skill and method, and displaying to excellent advantage her manifold products and resources. As in other sections, grain forms the bulk of the display; but of beans there are nearly 100 specimens, with grasses, leaf tobacco, hops, flax, and syrup made from the cane. The picking and preparation of hops, one of the most picturesque of out-door industries, are fully illustrated, and flax in its various forms, from the time it is harvested until



ENTRANCE, NEW JERSEY PAVILION

made ready for the manufacturer, is also a feature in the New York collection.

North Carolina completes the group of states that fill the place of honor fronting on the central nave, which is thus divided among the middle, western, and southern sections of the country. In her glass pavilion, divided into convenient partitions, the first group consists of cereals, grasses, and grass seeds, in more than 350 classes. Then come sorghum, and sorghum and sugar-cane syrup and seed, of which there are some fifty exhibitors. A third group consists entirely of peanuts, and a fourth almost entirely of beans. In another



CORNER OF NEW JERSEY PAVILION



NEW JERSEY CEREALS

a shaft of grain, surmounted by a terrestrial globe of silk, with the state of Missouri in exaggerated scale. On either side of the arched doorway at the principal entrance is a case containing the choicer varieties of Missourian grasses, and grains, tobacco, flax, hemp, sorghum, and castor beans are elsewhere displayed in nearly 200 classes.

Around the stairway leading to the gallery which divides this section is a palace of corn, which serves as an office and reception room. Here is illustrated in the form of statistics and maps the growth of a leading branch of Missouri's industry, her corn crop reaching, and at times exceeding 200,000,000 bushels a year. All classes of cereals are also displayed in the shape of a terraced

embankment, composed of jars of grain, and surmounted by an equestrian figure of Washington. A model of the great St Louis bridge, fashioned of sugar-cane and ornamented with grain, occupies another portion of the pavilion, in the construction and decoration of which there are samples enough to load a sea-going ship.

Except for Louisiana, the remaining exhibits of the southern states are grouped to the east of Missouri's pavilion. Here the two Virginias and Florida display their modest assortments in neat and tasteful pavilions, the Old Dominion giving the place of honor to tobacco with her wheat, corn, and oats in the background, while her western namesake reverses this arrangement. The state commission, the Louisiana Sugar exchange,



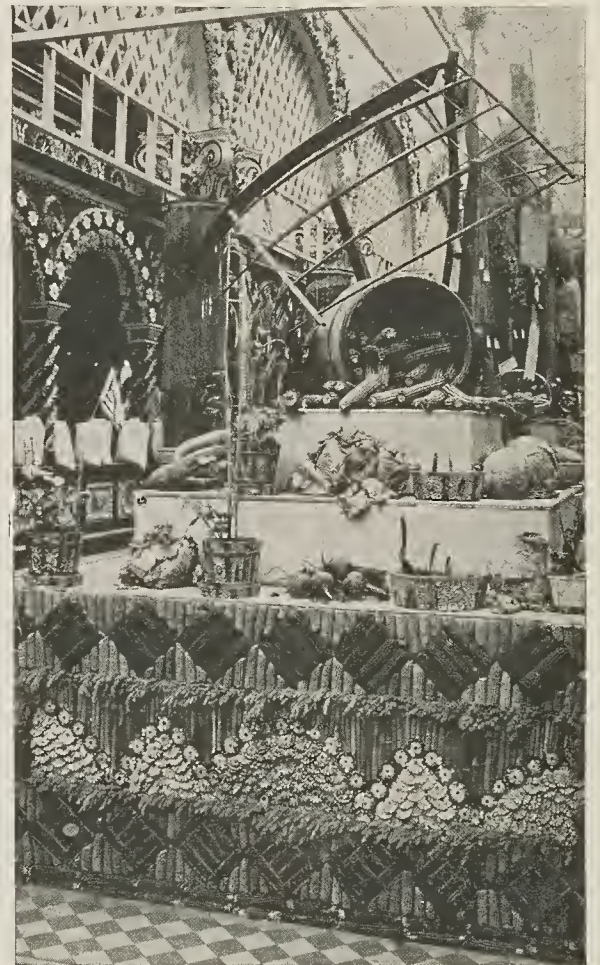
GRAIN ARBOR, NEW JERSEY

and the New Orleans board of trade and Cotton exchange were mainly instrumental in organizing a series of exhibits which illustrate the methods of cultivating, harvesting, and milling rice; of producing sugar, molasses, and syrups, of raising cotton, and manufacturing cotton seed oil. They have also a large display of tobacco and cereals, together with specimens of soils which experiment and chemical analysis have shown to be best adapted to staple products.

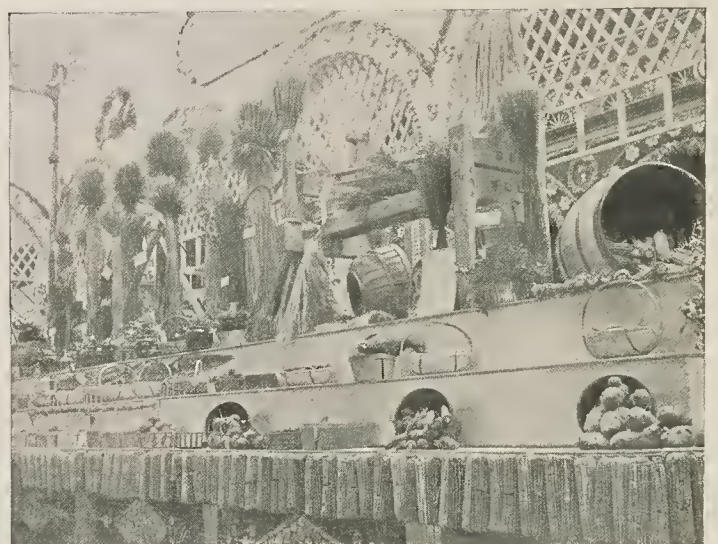
In the exhibit of the Louisiana Sugar exchange are photographs representing plantation laborers, warehouses and other buildings for handling manufactured products, and scenes within the exchange itself. The state exhibit

group cotton lint, seed, and bolls are repeated in two-score specimens, and among them is a little flax and flax-seed. Of hops and tea there are single exhibits, and of interest to scientific agriculturists are the samples of the soils best adapted to staple products.

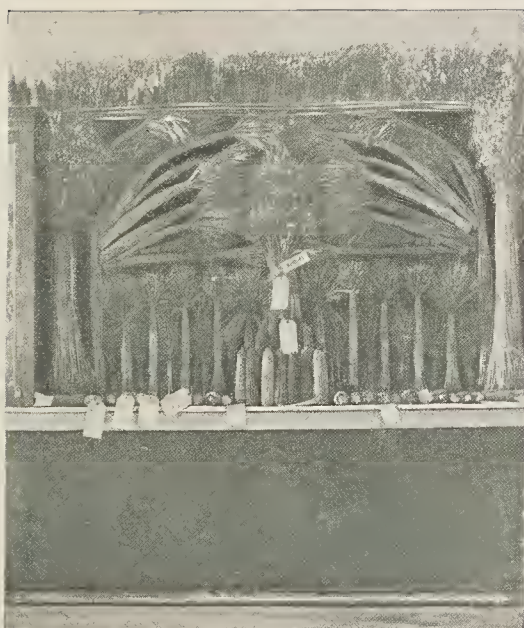
Near the eastern portal Missouri occupies one of the largest sections allotted to a state exhibit. An ornamental railing encloses the pavilion, which is in four compartments, and in the centre a pyramid, on whose sides are worked in grains and grasses the Missourian coat of arms, the seal of the United States, and a Columbian medallion. From this pyramid rises



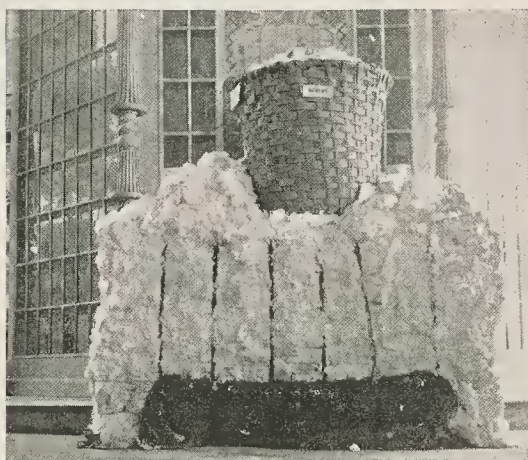
IN NEW JERSEY PAVILION



SOME NEW JERSEY EXHIBITS



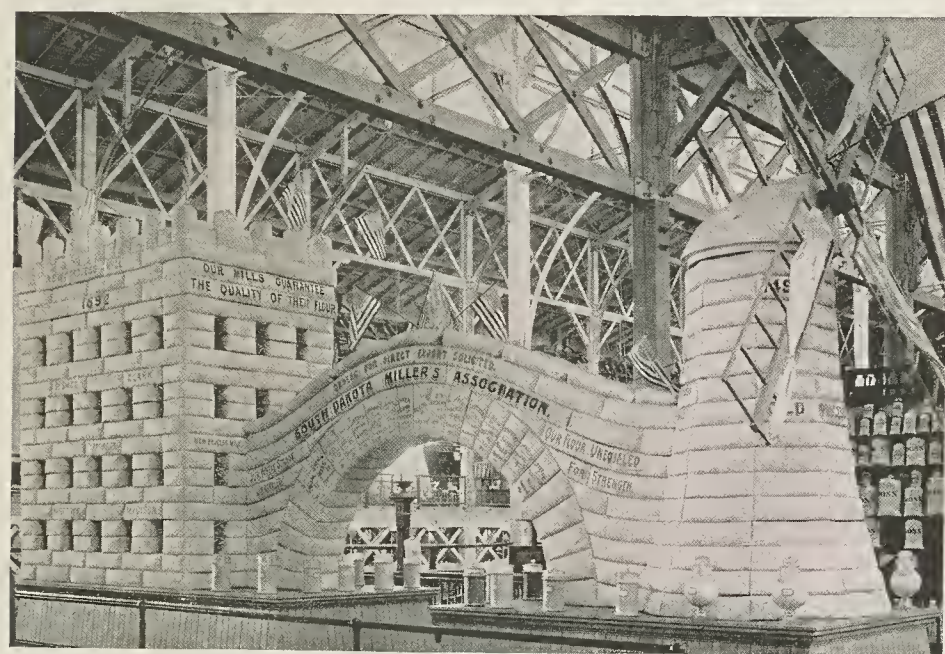
CEREALS



COTTON, WEST VIRGINIA

is divided into two main sections, designed to illustrate the development of the rice and the sugar industries. The so-called rice pavilion is thatched with the straw of that grain, resembling somewhat one of the Javanese houses on the Plaisance. It is surmounted by a marine monster in upright posture, with large eyes of bright colored glass. The pillars and walls of the sugar pavilion are of cane, both structures displaying the most artistic workmanship, and so arranged that they appear as one.

A portion of the Florida section is occupied by a Grecian pavilion, which serves as the official headquarters, tastefully furnished with exterior decorations of tropical plants, jute, sugar-cane, and other native products. Among the exhibits are samples of soil re-



claimed from the coast lands and everglades, those of the produce of the soil consisting of specimens of sugar, rice, cider, wines, honey, preserved fruits, and early berries, the last including a jar of strawberries gathered in the month of February. The small but tasteful and well ordered collection of Maryland completes the southern display, except for an assortment of Texan wools contained in the gallery. North and east of the Maryland pavilion are those of New Jersey and Delaware, the contents of which are to be commended for quality rather than quantity. Especially neat and home-like is the display of New Jersey products, above which is inscribed the following legend: "The battle ground of the Revolution, on whose fields many of these exhibits were grown."

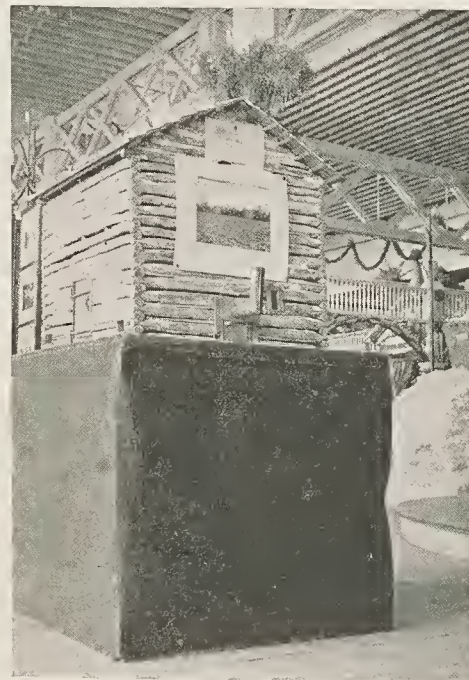
The New England participants are Massachusetts, Connecticut, New Hampshire, and Maine. Tobacco is a feature in the exhibits of the first two states, notwithstanding that in the former its cultivation has been strongly opposed by certain classes. The exhibit of Massachusetts is skilfully arranged, and includes photographic illustrations of many of her crops, with literature bearing upon agricultural topics. As an exposition of New England husbandry, which differs widely from western methods, a considerable space is devoted

to what is termed intensive farming, ravages of the gypsy moths, and other insect plagues. Within a glass case is a tree covered, and partially destroyed by the worms, with birds perched on the trunk, and barn-yard fowls at the base in the act of devouring them. New Hampshire has an attractive display, in a small red building enclosed with a rustic fence, and representing the typical New England granary, near which are tables covered with jars of grain. In the yard are benches and easy chairs, an old-fashioned flax-wheel, plough, and other agricultural implements of colonial times. On either side of the door are compartments

Here, also, is shown how to check the



COTTON, SOUTH CAROLINA



COTTON PICKER'S HOME



OKLAHOMA STATE EXHIBIT

timothy, oats, rye, barley, flax, and kaffir and broom corn. Considering that this territory is little more than four years old, her display is most creditable, and one that augurs well for her future.

Surrounded by the Pacific coast exhibits is the pavilion of South Dakota, the main entrance of which is in the form of a large triumphal arch, with a doorway on either side. The pillars, arch, doorways, and the supports of the section walls consist of the trunks of trees which were cut in March, 1893, many of



SOUTH DAKOTA GRAINS

Of the Pacific states, grouped almost in the centre of the American division, some are well represented in the Agricultural department, while others have but a slender display. First may be mentioned that of California, as the largest grain producing state in the group, one that in 1850 imported

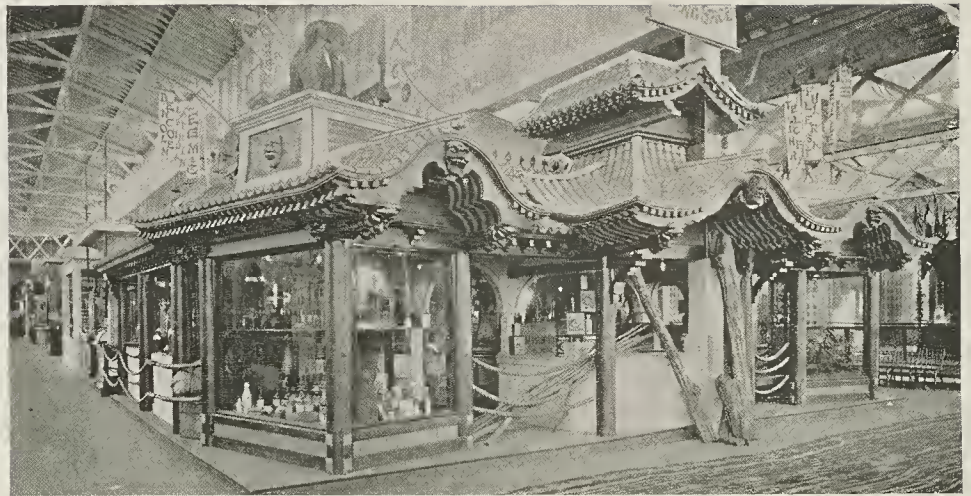


EXHIBIT OF SPICES

in which are specimens of the sugars and syrups for which the state is noted.

Across the passageway from the New Hampshire building is a pavilion bedecked with the brightest of the primary colors, that of Oklahoma, recently re-christened by its territorial legislature, the Mistletoe state, for this plant is found there in great abundance. As shown by the exhibits, its soil yields wheat, cotton, clover, maize, sorghum,

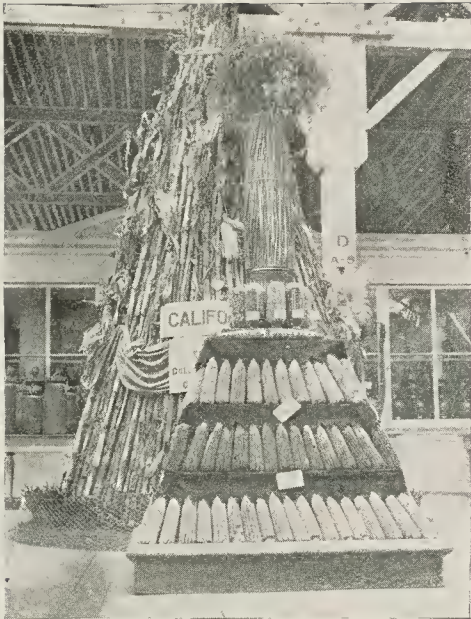


SOUTH DAKOTA'S PAVILION

them bearing twigs in full leaf. Wheat and grasses comprise the bulk of the exhibit, among the latter being specimens of the switch variety more than thirty feet long. Separated from this section by the California pavilion are those of North Dakota and Kansas, the former containing a profuse display of cereals, both in decorative and exhibitory forms. Above her pavilion is a woman of heroic stature, her right hand resting on a shield, and holding in her left a banner, the entire composition fashioned in grain, as are other elaborate designs. In the Kansas structure, rich in its golden hues, is proclaimed her rank as among the foremost of corn-producing states, the figures above the principal entrance indicating the year of her admission to statehood, and that in which was dedicated the World's Columbian Exposition.



DEVICES IN GRAIN AND GRASS, NORTH DAKOTA



CALIFORNIA GRAINS

almost her entire supply of cereals, and now ranks among the leading sections of the republic in yield, and export of wheat. In occasional years California has led all the rest in volume of production, and is among the few whose crop for a single season has exceeded 60,000,000 bushels. Of maize, a few million bushels a year are raised, and of barley, mainly for horse feed and brewing purposes, from 15,000,000 to 20,000,000 bushels, with a moderate export demand.

But cereal farming, and especially wheat farming, is no longer a profitable industry in California, unless conducted on a large scale, and with improved appliances. For this the reasons are not far to seek, with wheat selling, as in recent years, at from 70 to 80 cents a bushel, with labor at \$2 a day in the harvest season, and often

not to be had at that. Then there are excessive freight charges, with delay and difficulty in moving crops, large quantities of wheat remaining unhoused by the side of railroad tracks, where at times it becomes spoiled while awaiting transportation. No wonder that the smaller class of grain-growers cannot compete with those of Russia and Hindostan, where freights are almost nominal, and wages from a fourth to a tenth of California rates. But on the larger farms, some of them with many thousands of acres planted in wheat, the use of steam power in ploughing, planting, and harvesting has so diminished the cost of production, that in favorable locations wheat can be raised and placed at tide-water for less than thirty cents a bushel.

Of hay the California crop is from 1,500,000 to 2,000,000 tons, largely of alfalfa, as there is named the lucerne of the eastern states. With the aid of labor-saving appliances this can be raised at a cost of \$1 a ton, inclusive of cutting, curing, and stacking, while on irrigated lands three or four crops a year, each of as many tons to the acre, are no uncommon yield. Vegetables are largely raised, and especially beans and potatoes, the average yield of the former exceeding 50,000 tons, mainly of the Lima variety, while of the latter and of winter vegetables many thousands of tons are shipped to eastern markets. Of sugar-beets the product is from 10,000 to 15,000 tons a year, with three beet-sugar mills in operation, one of them the largest in the United States. All these and other industries are represented in the Agricultural department, and what has been said in this connection applies in a measure to other sections of the Pacific slope.

In comparison with the display in her state pavilion, the one contained in the Agricultural building is almost insignificant. And yet there are in this collection more than 70 exhibits of cereal crops, with 50 or more of beans, potatoes, and other vegetables, and several each of hay, grasses, and grain in the straw, and of olive oils, while of silk cocoons, and cotton on the stalk there are also single exhibits. Though not an imposing display, all the leading agricultural districts of the state, and nearly all their products, are represented in these California groups, and among them are the usual specimens of phenomenal growth, including melons, pumpkins, and beets, with potatoes one of which would almost suffice for a family dinner.

The booth itself is a plain unpretentious structure of glass and wood-work painted in light colors, and with little attempt at ornamentation.



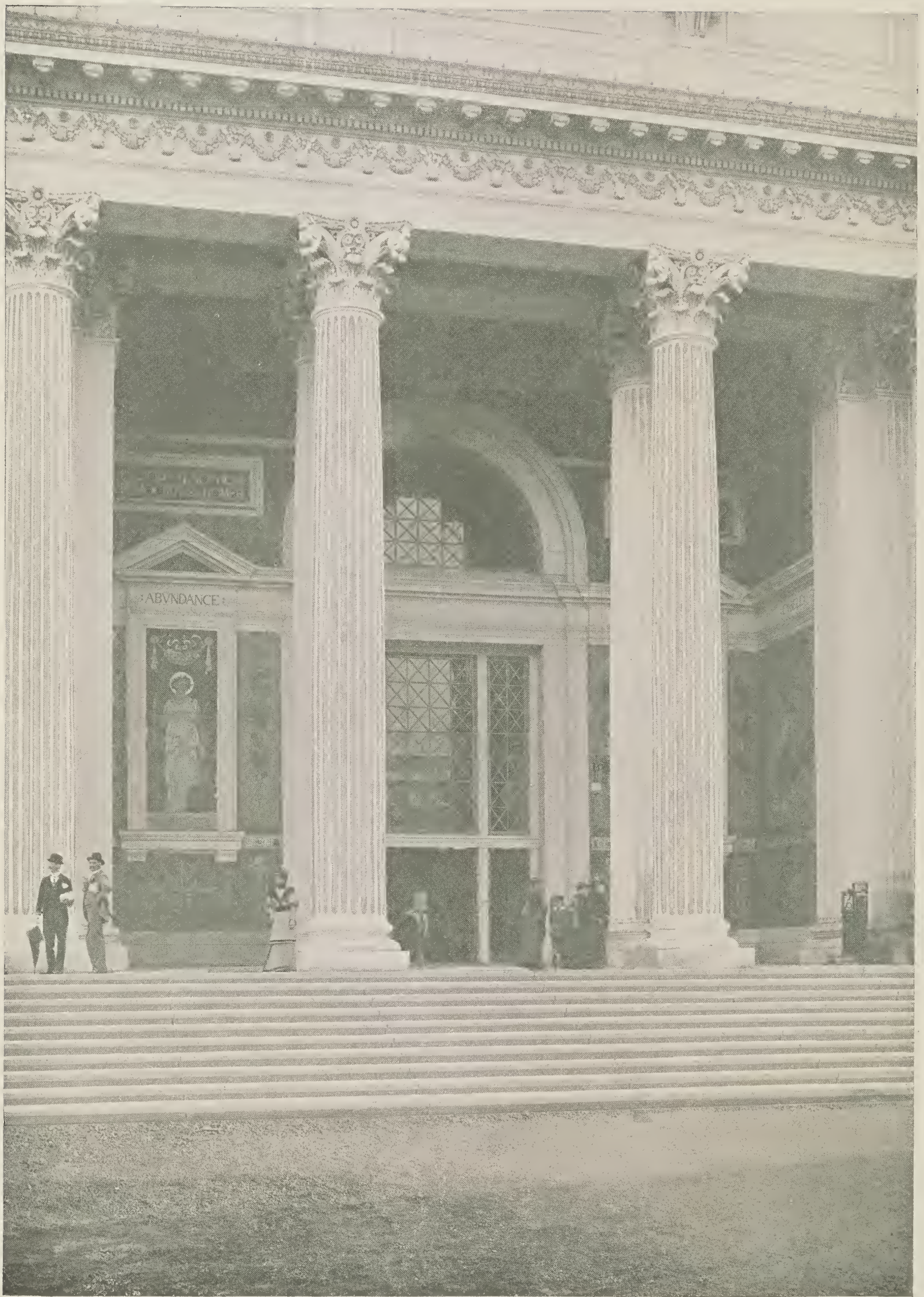
CALIFORNIA WHEAT



CALIFORNIA CORN



CALIFORNIA CEREALS



NORTH ENTRANCE TO AGRICULTURAL BUILDING

In the centre is a wigwam of unique design, constructed of Indian corn, and elsewhere are bouquets deftly fashioned of native grasses. The exhibits are neatly arranged, and show to the best advantage their several classified groups. But in other departments of the Fair, especially in the Mining and Horticultural sections, and above all in her own home among the state pavilions, California is seen to better advantage. Her display of fruit, for instance, is by far the best on exposition, representing one of her largest and most progressive

industries, one that with cheaper freights is capable of almost unlimited expansion; for to the consumption of fruit in crowded eastern centres there are no practical bounds, if it can be hauled to market at rates that will leave a fair profit to the producer, while placing it within reach of the great army of wage-earners. All this will come in time; and as the golden age of pastoral days was succeeded by the age of gold, as mining gave place to agriculture and stock-raising, so are these latter yielding the precedence to fruit-growing, which promises ere long to lead all other industries, as even to-day it does in the southern portion of the state.

Next to California, Oregon ranks first among the wheat producing sections of the Pacific coast; for ever since the days when were sown on methodist mission lands the first wheat planted in the Pacific Northwest, grain growing has there been a favorite pursuit. In her pavilion, which for reasons best known to the management was sandwiched between those of the southern and middle states, is a large collection of cereals, vegetables, grasses, and forage plants, fairly representing this stable and industrious community, one of the most steadily prosperous in the United States.

Of similar character are the exhibits from Washington, whose production of wheat has increased nearly four-fold during the decade ending with 1892, while for the same period Oregon shows but a slender gain, and California a decrease in yield. Of sheaf grain there are countless specimens, including cereals of all descriptions, and of threshed grain there are many varieties in display and decorative forms. Among them is wheat that has yielded nearly 100 bushels to the acre, and oats that have produced even more abundantly, with timothy hay nearly nine feet high, with vegetables of wonderful size, a complete assortment of field

and garden seeds, and flax in all its stages of growth. Farm buildings and incidents are reproduced in photographic illustrations, and there is a chart containing farm and crop statistics, while climatic conditions are represented as taken from government reports. Few of the Pacific or other states have displayed such interest in the Fair as this, one of the youngest of the sisterhood, two of her citizens taking on themselves the task of preparing an exhaustive exhibit from the counties in which they resided, while a third erected at his own expense, and stocked with grains and fruits, a pavilion in the Washington section.

Nevada, it need hardly be said, is not an agricultural region, though gaining steadily in this as in other branches of industry, now that she has fairly recovered from the depression caused by the faded glories of the Comstock. Except on irrigated lands, cereals can only be raised to advantage in a few locations, as in portions of Elko county, where 30 bushels of wheat to the acre or 50 of barley are no uncommon yield. The exhibits consists mainly of grains and grasses, arranged in frames, and housed in a neat and tasteful pavilion.

Utah's exhibit is well worthy of the community which, during its exodus from Nauvoo, halted midway on its journey to plant and gather grain, near the spot where now stand the cities of Council Bluffs and Omaha. Nowhere in the United States, and probably nowhere in the world have irrigation systems been developed with more economic method or with better results. When in 1846 the Mormons entered their western Zion, their land of Deseret, the first task to which they applied themselves was the construction of irrigating ditches. Twenty years later, when elsewhere on the Pacific coast artificial watering was almost unknown, nearly 300 canals had been built, with a total length of more than 1,000 miles, and conveying the mountain streams and melted snow to 170,000 acres. By 1892 the various systems had been so enlarged as to absorb nearly all the available water, the supply of which formed the only limit to further enterprises. Thus it is that several million bushels a year of cereals are raised on the arid soil of Utah, almost entirely by Mormon farmers; for the saints are essentially a farming community, leaving to their gentile friends the control of commerce and mining.



NEVADA'S EXHIBIT

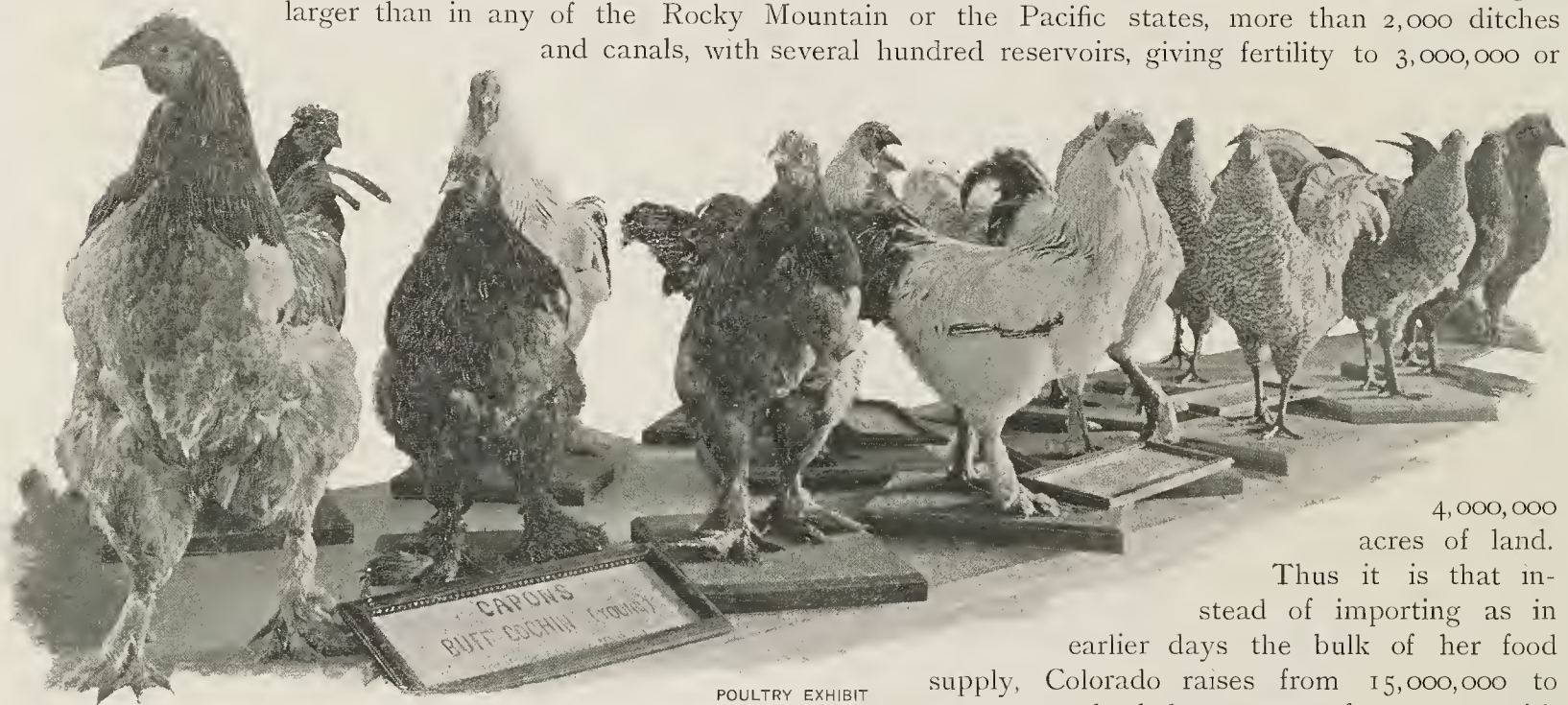


BOTTLED BEER FROM DENVER

On a sign attached to the Utah pavilion, which lies west of the Washington section, it is announced that everything contained therein was produced by irrigation. A large relief map represents the Malade valley system, with the waters of the Bear river canal and its branches, giving fertility to 150,000 acres of land. In the centre of the booth is the national flag, fashioned of lambs' wool blanketings. A pile of salt made from the waters of the great lake is walled in with bags of salt ready for use or export, and in a series of photographs are shown the natural gas wells in the neighborhood of Salt Lake City. Here also are displayed the nutritious grasses of the territory, with samples of its soil, and its clear unfiltered river water, while of cereals there are many samples, with a few of vegetables and vegetable seeds.

South of the Utah section are the exhibits of Idaho and Colorado, the former including the usual cereal collection, with some remarkable samples, as corn-stalks more than twice the height of a man, and on which are several cobs. In addition to grasses and hay, with vegetables and seeds, of many descriptions, there are specimens such as in former years it was declared impossible to grow on Idaho soil, among them leaf tobacco, flax, and Swedish turnips; but in truth there are few agricultural products that cannot here be raised on irrigated lands.

In the Colorado section is sufficient evidence that she is no longer, as some imagine, merely a mining and stock-raising region. Except for California, her area of land under artificial watering is larger than in any of the Rocky Mountain or the Pacific states, more than 2,000 ditches and canals, with several hundred reservoirs, giving fertility to 3,000,000 or



4,000,000
acres of land.

Thus it is that in-
stead of importing as in

earlier days the bulk of her food

supply, Colorado raises from 15,000,000 to
20,000,000 bushels a year of cereals, with

80,000 to 100,000 tons of hay, and of vegetables and dairy products more than suffices for home consumption.

On the frieze of the pavilion are depicted scenes representing the agricultural development of Colorado, and within, her irrigation system finds expression in a model of one of her irrigated valleys. In this structure no wood-work is visible, the entablature resting on arches covered with native grasses, and these on columns wrapped with grain. Among these groups is every variety of grain, threshed and in the sheaf, including some 400 specimens of wheat, 100 of oats, and 70 of barley and rye. There are samples of wheat which has yielded more than 50 bushels; of oats that have produced 130; and of barley, 80 bushels to the acre; but these are of course exceptional returns. In the centre of the display are shown the comparative quantities of grain raised on Colorado soil between 1874 and 1892. Of buckwheat, millet, and broom and Egyptian corn, there are a few samples; of flax a special group; and from Kiowa county, sorghum and sugar-cane.

Of native grasses and forage plants there are more than 100 varieties, a much larger number than was displayed at the Denver exposition of 1884. These are contained in the exhibits of the Colorado Agricultural college and the state commission, and show to excellent advantage the rich pastoral resources of the silver state. Among them are the grama and bunch and buffalo grasses which form the mainstay of sheep and cattle ranges. The cultivated species include sheaves of alfalfa, four to six feet high, bunches of clover two feet in height, and timothy hay with heads two inches long. Finally there is a collection of all the field and garden seeds of economic value.

Wyoming and New Mexico occupy small spaces in Agricultural hall, the former to the east, and the latter to the south of the California section. In both, the production of cereals and fruits is rapidly gaining ground under the stimulus of irrigation, and especially in Wyoming, this, the youngest of all the states, now ranking third in area of irrigated land, and second in mileage of irrigating canals. Her exhibit includes grains arranged in glass tubes, with native and cultivated grasses, hay, and vegetables, all produced, as is stated, by artificial watering. The New Mexican group consists entirely of grains, and especially wheat, of which there are nearly 500 samples.

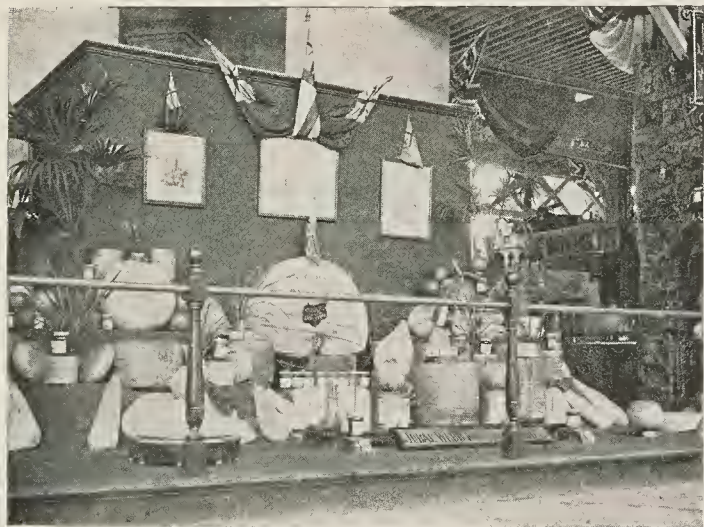
West of the New Mexican section is Montana's handsome pavilion, one of the most tasteful structures in Agricultural hall, and containing in its 200 or more exhibits an exhaustive representation of her products and

resources. Within is a pagoda fashioned of native grasses, and on a semicircular screen are presented the agricultural records of the state. As in other groups, cereals form the bulk of the specimens; but vegetables are also in good supply, with feed and fodder of many varieties, as blue-joint, blue-stem, bunch, and other grasses, clover of several descriptions, alfalfa, timothy, and red-top hay, and whatsoever else of grasses and hays is grown on Montana soil, its native herbage constituting a primary source of wealth. Though Montana is not an agricultural region, there are many sections well adapted to grain and other farming, with an average crop for 1892 of 33 bushels of wheat to the acre, 35 of barley, and 40 of oats, while on irrigated lands the average for all grain crops is nearly 42 bushels, and of vegetables 240 to the acre. Already there are some 250,000 acres of irrigated land in actual cultivation, and with the high prices of farm products, far above those of most of the Pacific states, Montana must cease to import, as now she does, a large proportion of her food supply.

Such are the agricultural products and resources of the Pacific slope, as represented at the Columbian Exposition, and here described somewhat at length as compared with other sections of the republic. As to the latter, most of my

readers are doubtless well informed; but to many the choice and varied display of certain of the Pacific states will be almost in the nature of a revelation. In 1850 the cereal crop of the entire western coast could have been placed on board a single sea-going ship; in 1892 several hundred grain-laden vessels carried her surplus wheat and flour to a score of foreign ports. Yet in this region, covering nearly one-third of the total area of the United States, there is infinite room for further development.

In the south-western corner of Agricultural hall is the collective exhibit of agricultural colleges and experiment stations connected with or under the supervision of the government. Grouped along the outer walls of this section are specimens of plant life, models illustrating the development of the plough, articles contributed by women associated with the domestic and industrial departments, and various instruments used in ascertaining the properties of soil. Within are exhibits from manual training schools, and apparatus contributed by the laboratories. In the latter are ascertained many valuable facts relating to insects and parasites injurious to grains, fruits, and live stock, with other matters



ENGLISH CHEESE AND HAMS

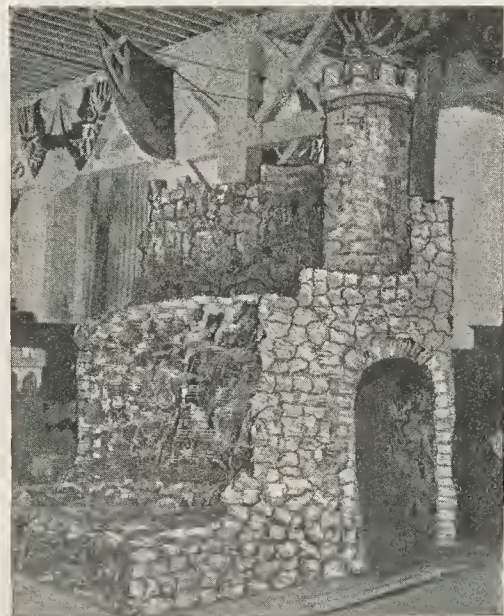
that concern the agriculturist. Beyond are exhibits of grains and vegetables from various stations, some blighted, and others in a healthy condition.

One of the most practical results of the experiments conducted by this branch of the agricultural department, is that which shows the effect of feeding to live stock different proportions of food elements. In a series of glass boxes are various grains, with layers of protein, carbohydrates, and fats, and beneath them are stated the several quantities required to produce ten pounds of additional weight in cattle, sheep, and swine. Experiments have also been made to ascertain what results would follow as to the production of fat or flesh, and beneath the vessels which show the proportion of food elements that entered into these constituents are represented sections of their bodies, with the distribution of fat and lean.

All the states have contributed to this collective exhibit, the Massachusetts college showing a collection of soils taken from different sections, accompanied by statements regarding chemical and mechanical analyses. The veterinary department of this college sends a model of a horse displaying its anatomy, and among the exhibits of the entomological section is the gypsy moth, with a story of its life, habits, and devastations. Plaster of paris specimens of Indian corn, parsnips, carrots, apples, pears, and potatoes occupy another case, samples being shown both of cultivated and wild varieties. In addition to these are charts with 3,000 figures, illustrating the systematic study of botany, and some ingenious apparatus for ascertaining the



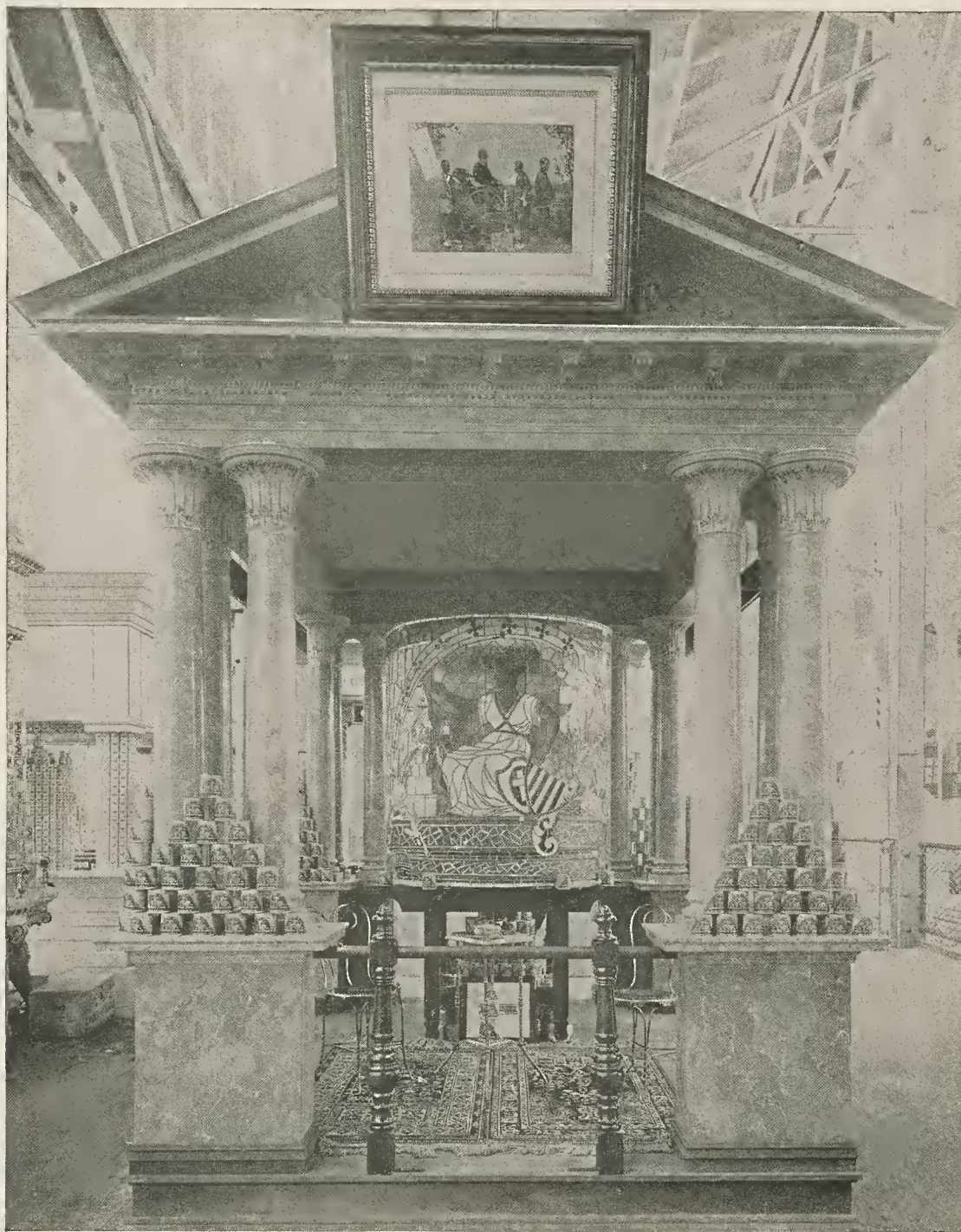
CHEMICAL LABORATORY



BOVRIL BEEF EXHIBIT

pressure exerted by the flow of sap through trees. Near the exhibits of experiment stations is a large array of mounted Indian fowls, contributed by the New York branch, and illustrating various methods of feeding and of treatment.

The entire display is neatly and systematically arranged, glass-covered cabinets, cases, and jars containing, not only farm products, but every form of life that pertains to farming in all its phases, including the care and breeding of live-stock. Here also is illustrated the botany of the farm, showing the seeds and plants best adapted to various locations, and when and where to place them, with many varieties of vegetables serving as food for man or beast. In the entomological section are cases of many-hued insects, some of them harmless, and others destructive to crops. Finally, it may be said that in this collective exhibit, almost hidden from view by the surrounding pavilions, is one of the most attractive features of the Agricultural department, one in which the colleges have given emphasis to the government display. The object of the former is to afford a scientific training, both practical and theoretical, in connection with the varied industries of the farm, to train their pupils in the elements of art, and to make of them useful citizens, whose hands are the ready instruments of thoughtful and cultured minds.

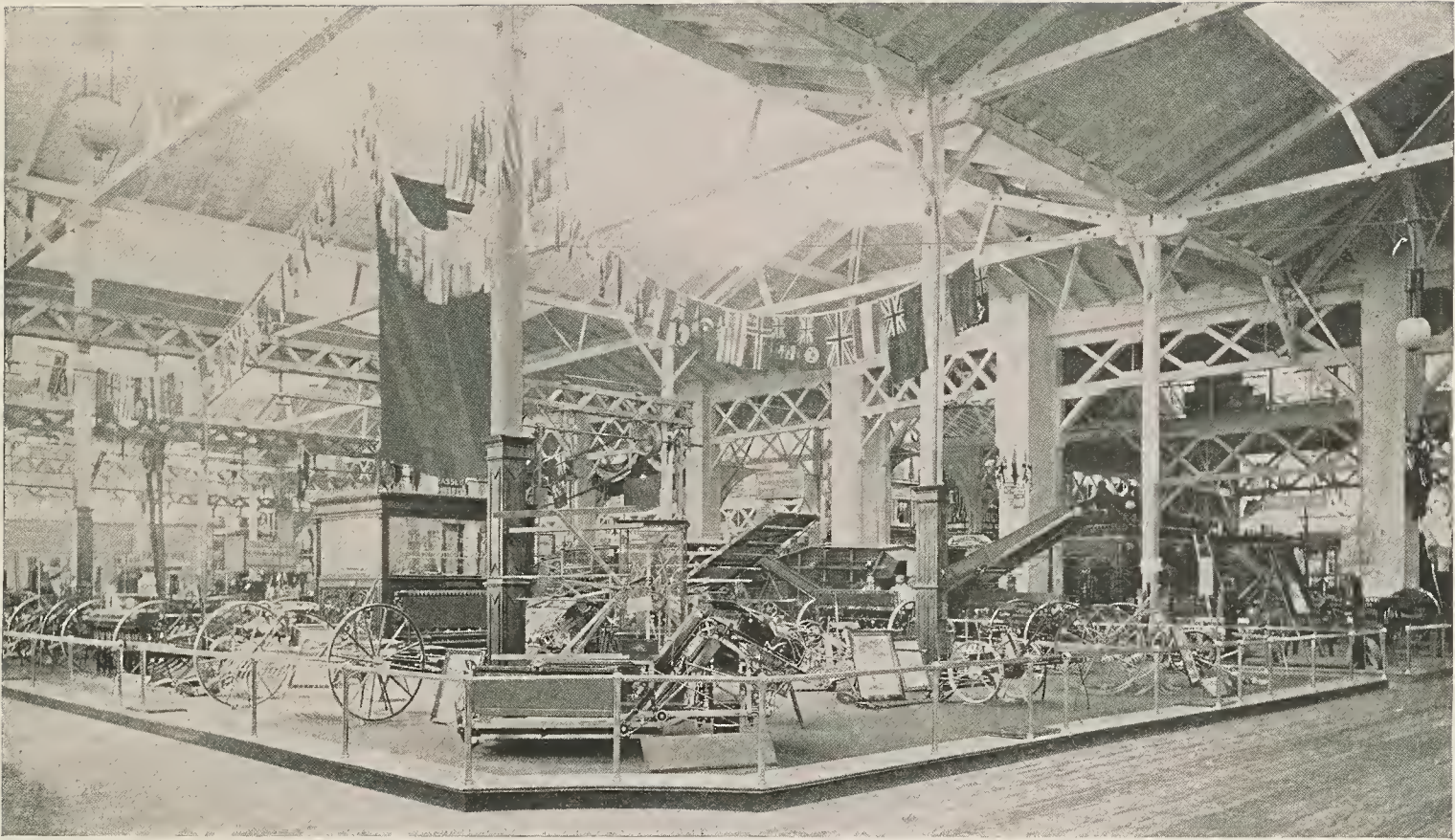


HIGHLAND CREAM COMPANY

In cereal and other raw products Great Britain is somewhat feebly represented in her 12,000 feet of space in the Agricultural building, her exhibits comparing unfavorably with those of Canada, which ships to the mother country a large proportion of her wheat surplus. In England the acreage planted in grain, and especially in wheat, is steadily diminishing, the decrease in the latter exceeding 25 per cent for the decade ending with 1892. For that year the entire area in wheat was only 2,300,000 acres, or less than was planted in the single state of Indiana. In many of the American states the acreage and yield in cereals is larger than in the British isles, where little more than 9,000,000 acres are actually under cultivation, but with a larger proportionate surface devoted to hay and root crops. In average returns, however, the comparison is largely in favor of the latter, where of wheat the normal yield is 30 bushels, of barley 33, and of oats 40 bushels to the acre. These results are due largely to the more thorough and systematic farming, rendered necessary by the smaller size of holdings, which for the United Kingdom averages less than 50 acres, only a few hundred among the 1,500,000 landlords and farm-

ers owning or renting more than 1,000 acres. Other causes are the rotation of crops, the fallowing of land for two or three years in succession, and the general use of fertilizers, of which more than 1,000,000 tons, nearly half of it imported at an annual cost of \$6,000,000 or \$7,000,000, aid in maintaining the fertility of the soil.

But with all his care and economy, the British grain-grower finds it no easy task to earn for himself a livelihood, so that many are turning their attention to root crops as yielding better returns, when taken in connection with stock-raising. In addition to hay, mangel-wurzel, turnips, and even cabbages are raised for winter feed, these being protected from frost, and mixed with dry fodder when distributed among the cattle sheds. Dairy farming is another prominent industry, and especially cheese-making, Stilton, Cheshire, and other



HARRIS-MASSEY EXHIBIT, CANADA

favorite kinds always holding their own in the market. Nevertheless Great Britain imports from Holland and elsewhere cheese to the annual value of \$30,000,000, butter and margarine that cost her nearly thrice that sum, while of the total consumption of milk, and that which is made of milk, requiring nearly 3,000,000,000 gallons a year, little more than one-half is produced at home. Hop-raising is a favorite, and in good seasons a profitable pursuit, especially in the southern counties, the yield for 1892 exceeding 46,000,000 pounds; for the British are a beer-drinking people, consuming more than 30 gallons a year per capita of population. Add to this market-gardening and fruit-growing, both showing a steady gain in acreage and production, and it will be seen that there are branches of remunerative farming still open to the British husbandman.

But while the outlook is not so dark as some would have us believe, it is nevertheless sufficiently gloomy; nor are the causes far to seek for this condition of affairs. First and chiefest among them are low prices, especially for grain, caused by over-production in the United States and India; these, with free trade, excessive taxation, complicated land laws, and the heavy toll demanded by railroads and middlemen, laying on the farmer a burden greater than he can bear. Thus it is that rents have gradually been reduced from twenty to fifty per cent, and in some localities, especially in Ireland, have almost reached the vanishing point, while there are large agricultural areas whose value has sunk to a level with that of the prairie lands of Iowa and Illinois. Though many remedies have been suggested, such as protection, bi-metallism, and the creation of peasant holdings, it is doubtful whether any or all of them would go far to mitigate an evil due almost entirely to low prices, one that can only be righted by increased consumption or diminished production.

From the agricultural experiment grounds of a Lancashire exhibitor are displayed samples of ears and grain, as the result of operations, extending over thirteen years, for improving, by careful selection and fertilization,

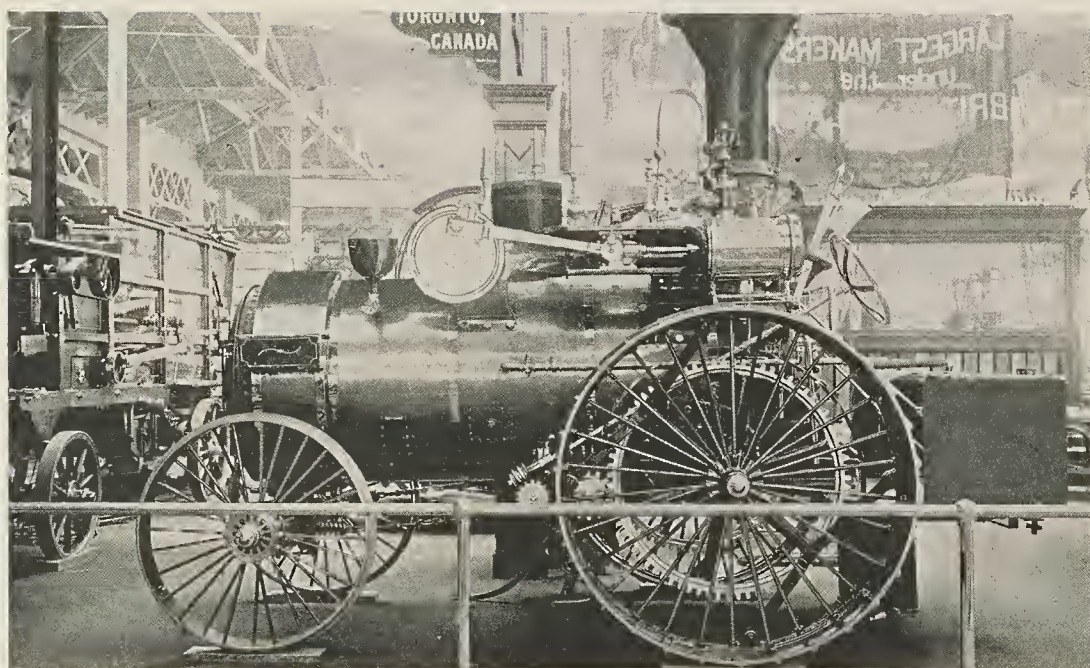
the cereals of all the principal grain-growing countries in the world. Add to these a few specimens of wheat and oats from a Kentish farmer, one of them showing 76 ears, and some 4,500 grains as the product of a single kernel, and apart from a couple of oatmeal exhibits from Deogheda, Ireland, we include about all that England has to show us in the way of cereals. Dairy products are represented



HAPPY FAMILY, CANADA



CANADIAN GRAIN



TRACTION ENGINE, CANADA

by a single exhibit, and dairy appliances by a collection of churns, and other apparatus, the latter from the London and Provincial Dairy company. Of animal and vegetable fibres there is also but one collection, and that from an Irish company whose headquarters are at Belfast. Among fertilizers and fertilizing compounds are included nearly all the varieties used in Great Britain, as guano, ground bones, phosphates, sulphates, and other chemical preparations. Near them is an exhibit of eucalyptus oils and eucalyptus soap, the former in a dozen varieties as manufactured from various species of the gum-tree by a company whose works are in the Australian colony of Queensland.

Food preparations are better represented, as also are mineral waters, temperance beverages, and malt and spirituous liquors. From the British Bee-keepers' association comes an exhibit of 1,000 pounds of extracted honey, contributed by 100 apiarists, with books, pamphlets, and diagrams used by the society's lecturers and experts. By a coöperative organization are displayed samples of English, Scotch, and Irish honeys, with beeswax in various forms. In the same group is an exhibit of Queensland cane sugar, now largely produced in that country by Kanaka labor. Of tea, coffee, cocoa, and chocolate there are many varieties, and among the first is one from the Sylhet tea gardens in London, showing the plant in every stage of growth, as raised in that district of the Indian province of Assam. Preserved meats, soups, fish, fruits, and vegetables are in liberal supply, with combinations and concentrations for which special virtues are claimed, as those of the Bovril company, prepared from essences of beef, its exhibits housed in the most picturesque of booths, with office representing a fortress enthroned on a steep and rugged cliff. Of mineral waters there is a large array, and with them are many other drinks for the total abstainer, including such non-alcoholic preparations as hop bitters, beer, fruit cordials, and orange champagne.

Except for a few samples of London gin and compounded spirits, whatever these latter may be, the samples of alcoholic liquors are limited to Scotch and Irish whiskeys, the former including the finest of Highland brands, and the latter the famous poteen which, in its purity, is one of the best of whiskeys, though for every gallon of the real article a hundred are sold under its name. Among these exhibits is a round tower, forty feet high, and constructed entirely of whiskeys in wood and bottle from a Dublin distillery. Allsopp's, Tennent's, and other favorite varieties of ale, porter, and stout are classed in a separate group. Of tobacco, an interesting display is that of the British North Borneo company, including leaf for wrappers, and cigars made entirely or in part from the products of its plantations. A similar exhibit is that of a company whose estates are in Sumatra, and a Birmingham company shows its appliances for rolling the leaf into coils or plugs, and for the making of cigarettes.

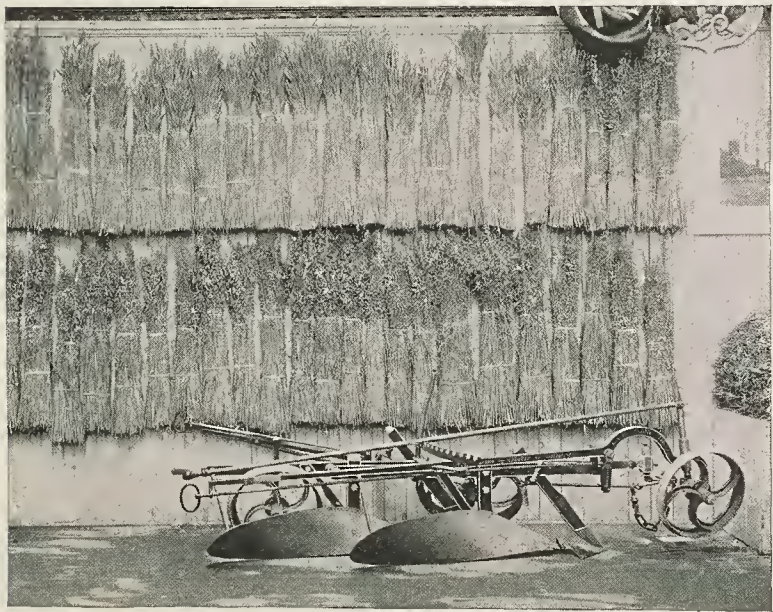
But the most attractive exhibit in the British section is a model of the Brookfield stud farm, at the foot of the Highgate hills, within a few miles of the most densely thronged of London's business centres. The stud is the property of W. Burdett-Coutts, whose "unearned increment" of wealth, with the influence that wealth commands, won him a seat as member of parliament for Westminster. Its purpose is to preserve and improve the old English breeds of coach-horses, hackneys, cobs, and ponies, some of which were in danger of becoming extinct. In the model are reproduced with remarkable fidelity of detail, all portions of the farm and stud, from the cottage of the groom, and the office where clerical work is done, to the covered yard, the clean well ventilated stables, and loose boxes, the harness room, the riding-school, the granary and barn, and the show-ground with its wide expanse of turf.



THE LARGEST CHEESE IN THE WORLD

There is also a collection of oil paintings by prominent artists, including those of the sire of Brookfield, and other famous hackneys.

East of the British section are the more compact exhibits of Canada, contained in three pavilions, one of them displaying the cereal, root, and other products of the government's experimental farm at Ottawa. There are also minor pavilions erected by the officials of the agricultural colleges of Ontario and Quebec, the latter structure in two portions, made of tobacco and grain. Near the enclosure which surrounds the government pavilions is a heterogeneous collection of articles, among them flour, starch, maple syrup, mineral waters, malt extracts, beers, and ales. Of cheeses, the making of which is a prominent Canadian industry, there is a sufficient display, and one of the chief attractions in this section is a monster cheese, encased in an iron tank, and mounted on a platform approached by a flight of stairs. On an inscription attached to the stand we are informed that it weighs 22,000 pounds, and that to supply the materials more than 1,600 maids milked 27,000 gallons from 10,000 cows. Manitoba, British Columbia, and the northwest provinces are all represented in the Canadian division, where are also mounted specimens of the white and black bear, of deer, goats, antelope, wild geese, and turkeys, with other illustrations of Canadian fauna.



NEW SOUTH WALES CEREALS

fifteen varieties of Canadian woods, such as are used in the construction of its machines, and included in its collection are the medals awarded at former expositions. In all some thirty firms have samples of agricultural implements, and among them are a few special apparatus, as pea harvesters and sap evaporators; but as for the most part one agricultural machine is very like another, when used for similar purposes, it is unnecessary here to describe them in detail.

A feature in the Agricultural building, and one that has never been seen before, except at such local expositions as were held in Sydney and Melbourne, is an exhibit of the agricultural products of the Australian colonies, and especially from the oldest of her colonies, that of New South Wales. It is now some three centuries since a French navigator, landing on the western shore of the continent, found there, as he relates, a boundless expanse of forest primeval, with no signs of life nor anything that would support it, save for a few human and marsupial bipeds, the former so degraded that he hesitated whether or not to class them among the brute creation. But on this continent, with an area about equal to that of the United States, there is now a larger white population than on the entire



ENTRANCE NEW SOUTH WALES PAVILION

In the annex is a collection of Canadian agricultural machinery, and as neither

Great Britain nor any other of her dependencies have any exhibits of the kind, it represents the contribution of the entire empire in this department. The largest display is from a Toronto company, and includes binders, threshers, cultivators, mowers, and a Manitoba straw-burning engine. The last is used by agriculturists in regions where wood is scarce, and is fitted with a tubular boiler of peculiar construction, whereby a forced draft may be obtained. The cog-wheels are of aluminum, and connected with the thresher, which is supplied with an ingenious device for measuring the amount of grain that passes through it. The company's office is panelled with



CANNED GOODS, NEW SOUTH WALES



GRASSES AND FAT TAIL SHEEP, CAPE COLONY

market gardens, \$22,000,000, and of cane-sugar, \$10,000,000, the last produced only in Queensland and New South Wales. Of wool the clip from 125,000,000 sheep, more than twice the number contained in the United States, was valued in 1892 at nearly \$20,000,000, and of canned and frozen meats there is a considerable and steadily increasing export. In the latter department the colonies are encroaching somewhat on the American trade, for beef and mutton are worth less than half the prices paid for them in the eastern states. Such is the industrial condition of Australia, a country yet in its infancy, with a population of less than two to the square mile, but with resources which, until recent years were not appreciated even by the Australians themselves.

Notwithstanding a serious depreciation in the price of wool, with little prospect of improvement so long as sheep continue to increase in two-fold ratio as compared with the human race, sheep-farming continues to be, as it ever has been, the greatest of Australian industries. And especially is this true of New South Wales, whose exports of wool for 1891 amounted to 332,000,000 pounds, valued at \$56,000,000. As to the quality of this wool we have a complete illustration in the exhibits of the Australian section, forming the largest collection of the kind in Agricultural hall. In this collection there are no less than 400 bales, representing many varieties, from the soft merino fleece, prized for its purity and texture, to the coarser grades valued for quantity rather than quality of clip. At the entrance to one of the apartments is an arch constructed of solid bales of wool, and within or abutting on the aisles are pillars and pyramids of similar construction, with bins and cases filled with samples in bulk or fleece. There are also pictures of sheep and sheep stations, and as though standing ready to start on its journey of many hundreds of miles is a heavy wagon, laden with wool, more cumbersome even than the so-called prairie-schooners which bore across plain and mountain of America the argonauts of 1849.

In another apartment are the exhibits of cereals, flour, oils, and such as represent the tanneries and meat-preserving processes of New South Wales. Among them is an arch of corn cobs, artistically fashioned, and representing a prominent branch of colonial industry; for

Pacific coast, a contented and in the main a prosperous community, one that has built at least two cities larger than the Pacific coast metropolis, with many of smaller size. Among its sheep-farmers and stock-raisers are not a few who count their herds by tens of thousands, and their flocks by hundreds of thousands, the wool-clip of a single station, as the Australian terms his rancho, sufficing to load a clipper ship.

While not an agricultural country, in the proper sense



ANGORA GOAT AND SKINS, CAPE COLONY

of the word, Australia is more than self-supporting, producing of certain staples a much larger surplus for foreign markets than offsets the importation of others. Though wheat thrives badly on its thin, arid soil, an average crop represents a value of \$30,000,000, and yet the average yield does not exceed seven or eight bushels to the acre. Of other cereals the product is worth some \$25,000,000; of hay an equal amount; of root crops \$20,000,000; of vineyards, orchards, and



GOATS AND SHEEP, CAPE COLONY



WINE, CAPE COLONY

gold, and took from us in the same year goods to the value of more than \$6,000,000, while shipping to this country little more than half that quantity of exports. While Australian merchants deal more largely with the United States than with any other foreign nation, their transactions are trifling in comparison with those of Canadian business men, who purchase in American markets nearly one-half of all that they require.

Small in size but of excellent quality, complete, compact, and in perfect taste, is the exhibit of Cape Colony, grouped in a glass pannelled enclosure decorated with banners and bannerets, its windows hung with ostrich eggs, and depicting the flora and scenery of southern Africa. On a revolving frame within is a choice collection of water colors, representing in natural size and hue the most beautiful and fragrant flowers and creepers, indigenous and exotic, among them some wonderful orchids and vines. In the decorative scheme is largely used a gray, silvery vine, which so far as is known grows only on Table mountain, near the foot of which lies Cape Town. Flanking the entrance ways are cases filled with ostrich plumes in their various shades of color,

from those of grayish-brown, such as cover the back, to the soft, fleecy

feathers, white as the driven snow, that are plucked from the tip of the wing. In the centre of the booth is a gigantic ostrich, and mounted on stands are two full-grown birds in all the glory of their plumage. In one of the cases, side by side with a large pyramid is a select assortment of eggs, some polished, and others painted in various designs.

Of other birds the collection is remarkable for variety of species, and brilliancy of plumage. Fish are represented in water colors, their scales displaying all the brilliant hues of semi-tropic climes. In the centre of the booth are mounted specimens of animals, showing the highest art of the taxidermist. Among them is an Angora goat, with its silky coating of hair, a fat-tailed sheep, whose unwieldy appendage is esteemed by Kaffirs a delicacy, and a so-called Boer goat, whose hair and carcase are worthless, and whose mission in life is to guide homeward the flocks at nightfall. Elsewhere are specimens of furs, and pelts, with rugs fashioned from the skins of the golden jackal and



NEW ZEALAND HEMP



OSTRICH EGGS, CAPE COLONY



GRAIN AND GRASSES, FRENCH EXHIBIT

in the form of a pyramid, and side by side with bush or native tea is tobacco, cured, and in the leaf. Of cereals there is a small display, but one of superior quality, including samples of wheat that weighs nearly seventy pounds to the bushel. There are also the buchu leaves, used for medicinal purposes, with native grasses, gum-arabic, and dye and other woods of many descriptions.

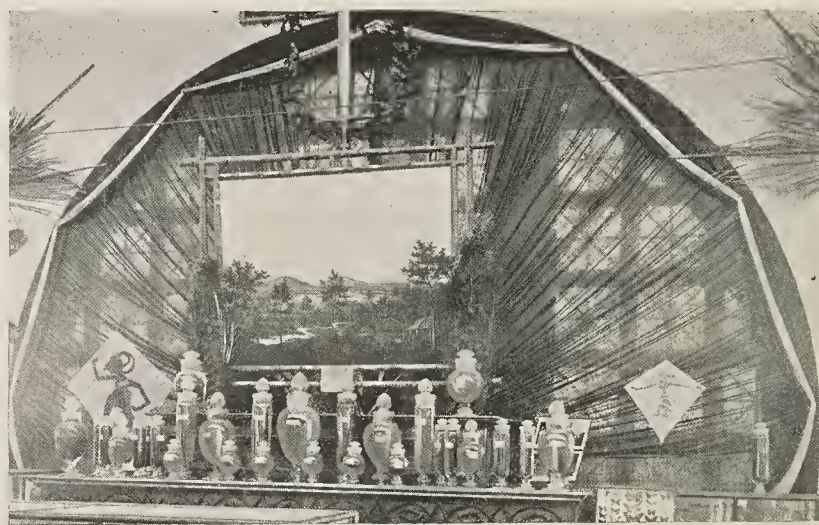
Of miscellaneous articles there is an interesting assortment, including Kaffir, Zulu, and other weapons, implements, and curios, among them the assegai, thrown by the African bushmen with unerring aim, and which in the Zulu war dealt his death-blow to the prince imperial, son of Napoleon III. There are also the insignia of chieftaincy, including a curious cloak made of strands of twisted fur, such as is worn by a chieftain's wife on state occasions.

North of the Australian section, and adjoining the rotunda of Agricultural hall, is the pavilion of Ceylon, with pillars of ebony and wood-work elaborately carved. Tea forms the principal display, and those who are so inclined may test the quality of the brew, as prepared and served by native attendants. There is a model of a

tea plantation, and in diagram form is shown a thirty years' record of Ceylonese exports to Great Britain, where most of the surplus teas are marketed. Other exhibits are native woods; cinchona, or, as it is more commonly termed, Peruvian bark; desiccated cocoa-nut, and the products of cocoa-nut



CORK EXHIBIT, ALGERIA



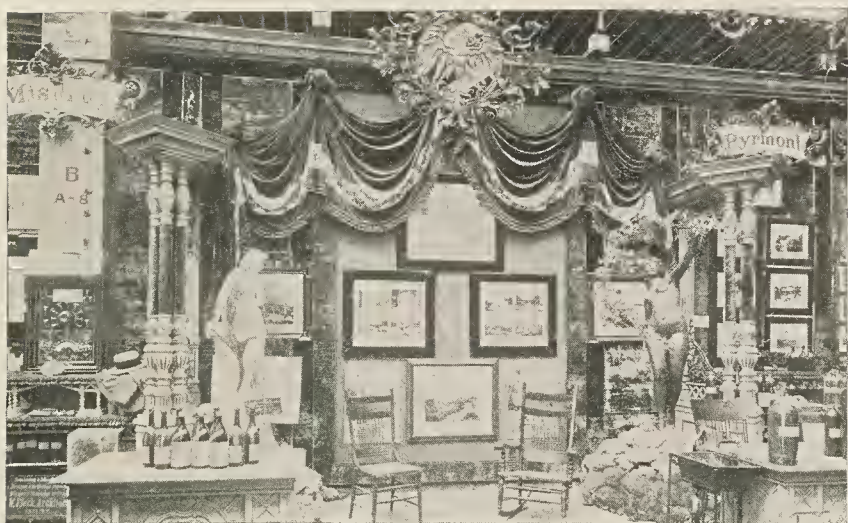
JAVANESE EXHIBIT

fibre, as in mattings, ropes, and basket-work, these with a few skins, a case of plumbago, an irrigating machine, and a small collection of agricultural implements, including about all that Ceylon has to show us in this department.

In France about one-half of the entire population depends on agriculture for a livelihood, the number of proprietary and tenant farmers amounting to nearly 4,500,000, the majority

the spotted tiger. Of tusks there is a fair collection, including what is said to be the largest elephant's tusk in existence, more than seven feet long, and weighing nearly 160 pounds.

Of wool and mohair there is a plentiful display, the latter selling in the London market at thirty-five cents a pound, and comparing favorably with Turkish and other growths except for length of staple. Though a comparatively recent industry, exports of mohair for 1891 amounted to some 10,000,000 pounds, while those of wool for the same year exceeded 75,000,000 pounds. Cape wines and brandies are arranged



GERMAN SECTION

effort, the \$200,000,000 of her war indemnity, to sink nearly twice that amount in the Panama canal project, and pay as interest and sinking fund some \$260,000,000 on her \$6,500,000,000 of national debt.

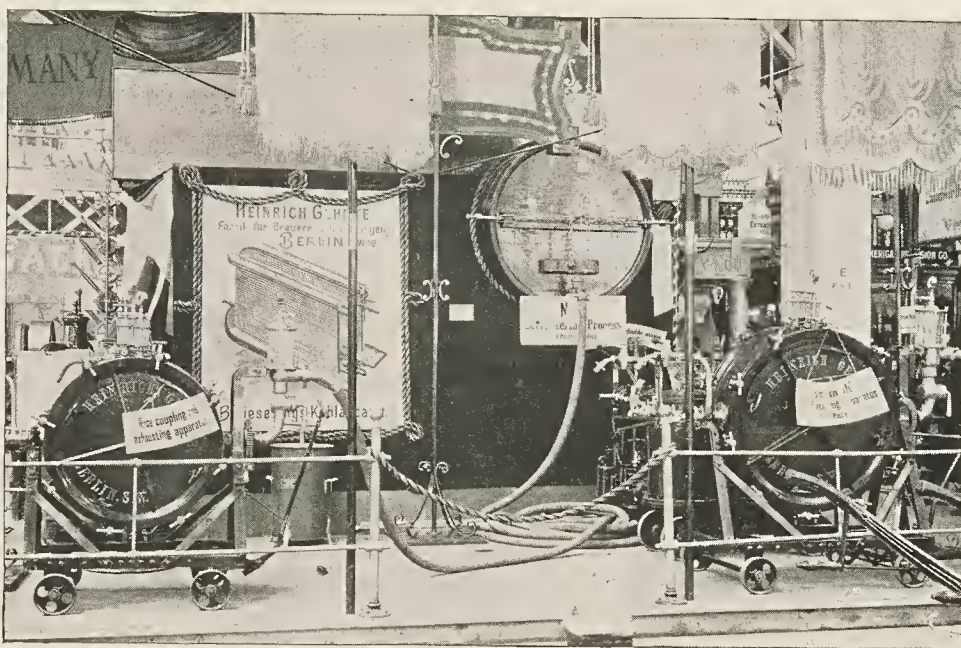
France and her colonies occupy sections in the annex, and the western and eastern portions of the main building, the exhibit of the government being installed between that of Russia and the United States. This consists largely of maps and charts, showing the location of vineyards, agricultural districts, and national schools of agriculture, with such statistical tables as represent the fluctuations in the prices of bread and breadstuffs throughout the republic from 1830 to 1891, and of meats and all agricultural products during the seventeenth and eighteenth centuries. The results of various experiments in the government laboratories are also given, and there is a model of the testing field, connected with the government seed house, with photographs illustrating the province of the French agricultural department, especially in sugar-beet culture, as conducted at the government farm at Grignon. In addition to these are models and programmes of the primary agricultural schools, with their methods of education fully explained.

Fronting on the eastern extremity of the central transverse nave

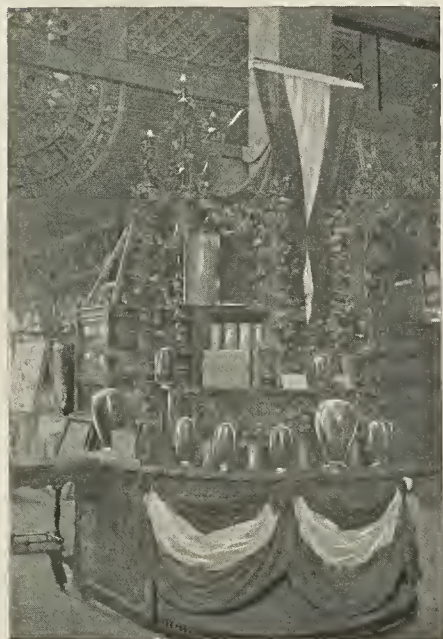
are displayed the products of French farms, including food preparations. Grains and vegetables are arranged along the walls, with seeds and colored illustrations in the centre. Elsewhere are barrels of flour, glass cases filled with refined sugars, canned vegetables, fruits, and nuts, salad oils, liqueurs, and delicacies in solid and liquid form.

In the French pavilion the main attraction is a rectangular structure, about thirty feet long, and half that width and height, with an arched door-way in the centre composed entirely of small papers of chocolate manufactured by a Parisian house, and representing the daily output of 50 tons, valued at \$40,000. In the

belonging to the former class, with about an equal number of laborers and domestics. Add to these the wives and families of agriculturists, many of whom share in the work of the farm, and we have a total of some 19,000,000 persons supported by this industry. Partly through the agency of the law which requires the father to bequeath his property in equal shares among his children, the subdivision of farms has here been carried to an extreme. Nevertheless France still imports largely of cereals, the total of her average crop not exceeding 40,000,000 bushels a year. Nowhere are better understood the advantages of diversity of farming, and nowhere are the agricultural classes more frugal and industrious. Largely through their contributions France has been enabled to pay almost without apparent



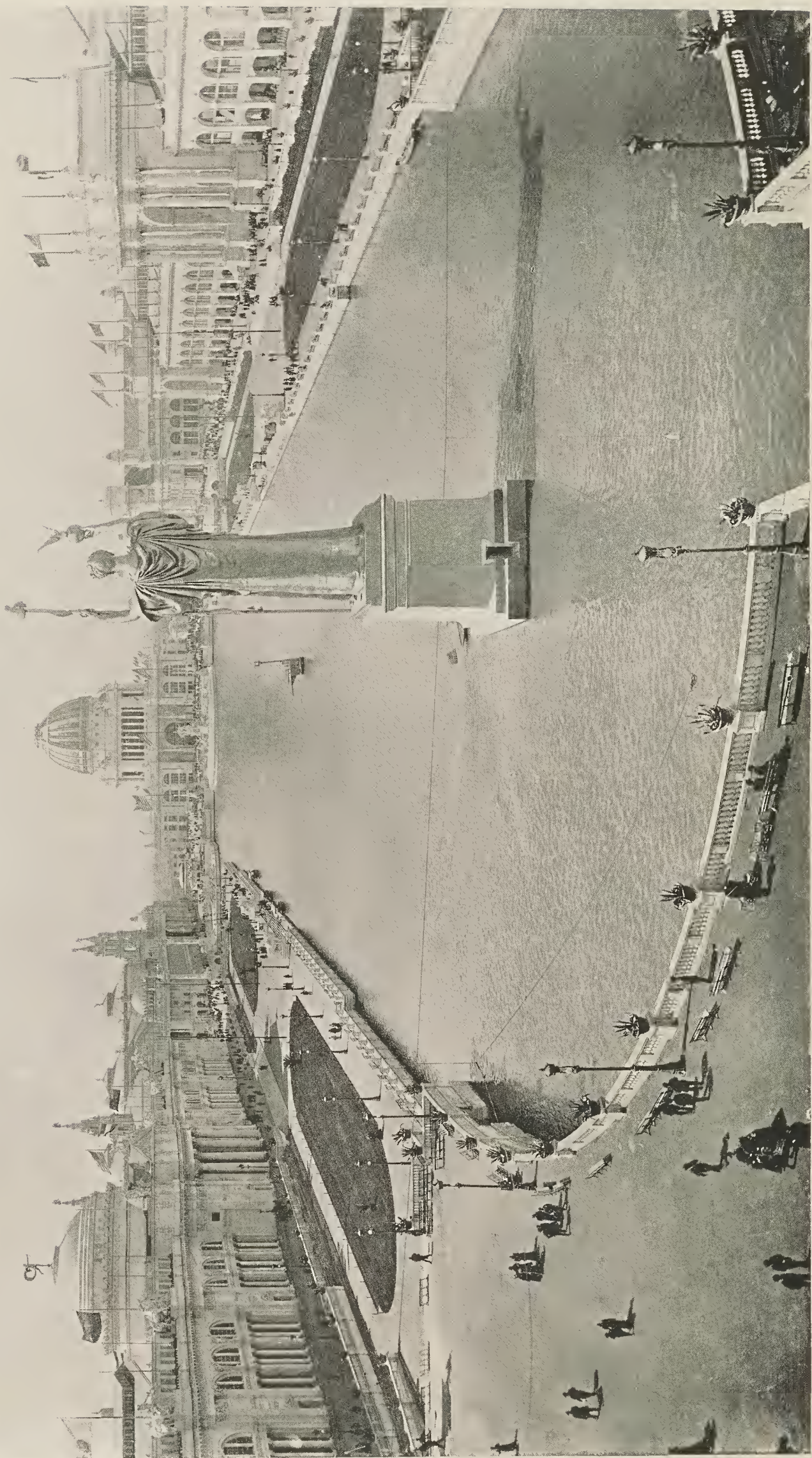
GERMAN BEER FILTERING APPARATUS



BREWING PROCESS, GERMANY



APOLLINARIS WATER, GERMANY



GRAND BASIN AND COURT OF HONOR



RUSSIAN GRAIN EXHIBIT

palace of the Algerian governor, and adjoining it is the office of the colonial commissioner, with collections of native woods bound in the shape of volumes, a carved and inlaid cabinet, specimens of needle-work, tobacco, and minerals, and typical illustrations by native artists.

In Germany more than one-third of her 50,000,000 of inhabitants are supported by agriculture, the total number exceeding 19,000,000, of whom nearly one-half are actual farmers or farm laborers. About fifty per cent of the entire area of the German empire is classed as arable lands, of which there are 65,000,000 acres, a goodly surface in truth, but less than is contained in a couple of our western states. As in France, agricultural lands are here minutely subdivided, with 2,500,000 farms of less than two and a half acres, and perhaps an equal number below 25 acres, while of those above 250 acres there are less than 25,000. Even the smallest of these holdings include a certain percentage of meadow and cultivated pasture lands; yet each of them suffices for the support of a family. But with his careful and laborious husbandry, the German turns his land to the best account, raising of wheat an average crop of nearly 50 bushels an acre, with other cereals in proportion, while of potatoes the yield is five times as large, far surpassing that of Ireland, the "land of potatoes and poteen." In Austria and Hungary considerably more than one-half the population is maintained directly or indirectly by agricultural pursuits, which, especially in the latter country, are rewarded by excellent returns.

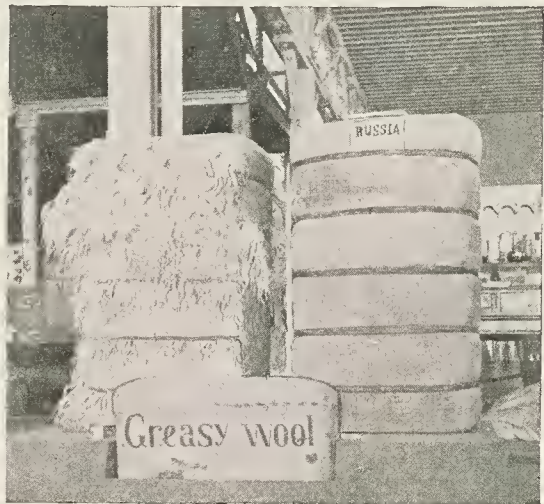


THE DANISH PAVILION

annex is a display of distillery apparatus, and a large portion of the space is occupied by a model barn, with granaries, stalls for live-stock, and other farm buildings enclosing a central yard.

In an adjacent section to the north of the pavilion the French colony of Algeria displays her products, the main exhibit consisting of cork in many varieties. The principal entrance to the Algerian edifice is framed with slabs of cork; within is the tree itself, and there are many carvings of superior design and execution. The rough bark is exhibited in bales, and sheets of cork are shown for use in the linings of hats, and the insoles of shoes. The entire collection represents an industry which is making rapid headway, 'if we can believe the statement here contained, that in this colony more than a million acres are covered with young cork-trees, not yet in bearing.

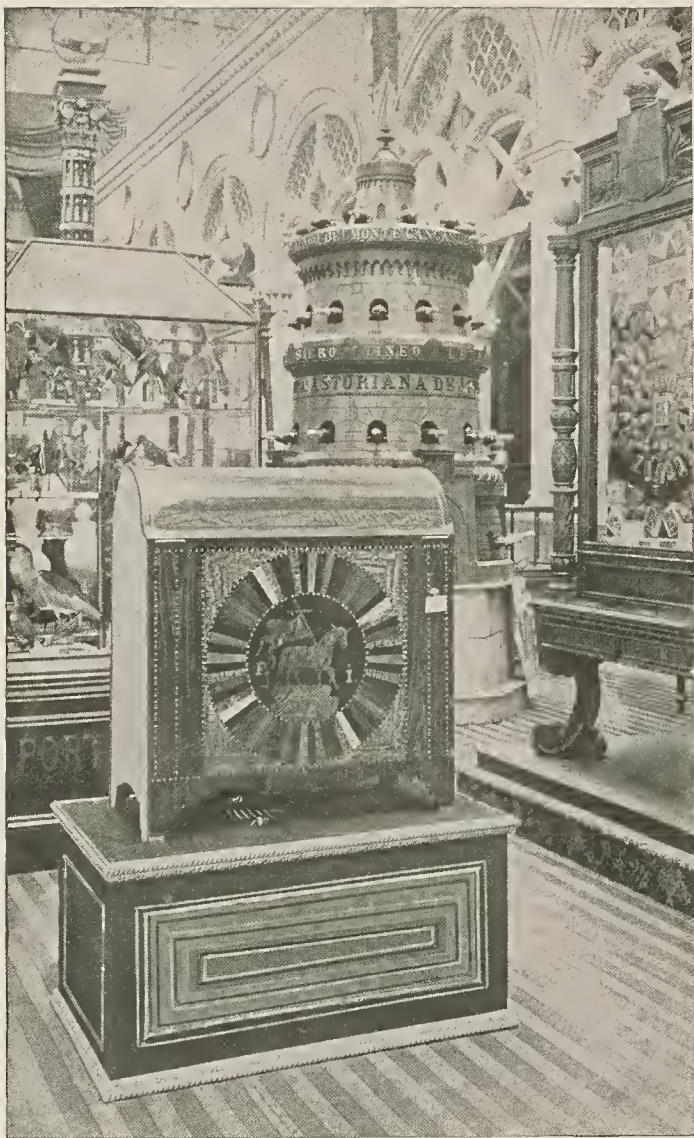
Cordage is also a leading Algerian product, many of the specimens here displayed being made from the native grass known as alfa. A mass of silk cocoons attached to the branches of a mulberry tree points to another prominent industry, as also the cases in this vicinity containing such products as olive oils, nuts, dried figs, grains, and cigarettes. Across the aisle from the main section is a tasteful structure containing a central court cooled by a beautiful fountain, its enclosing arches and floor in imitation of marble, and its walls hung with Moorish tapestries. This is a reproduction of an apartment in the



WOOL IN THE GREASE, RUSSIA

The German and Austrian groups, the former by far the more interesting and extensive, are separated from the British section by the main longitudinal nave. In the latter the most noticeable feature is that which represents the mineral waters of Austria, an exhibitor from the neighborhood of Carlsbad displaying a huge metallic bottle at whose base is a number of the vessels used in the trade. Hops, barley, and seeds, wax and waxen goods, are also on exposition, with powders for the destruction of insects, and appliances and publications relating to the several industries of the apiarist.

In the German section, are two main centres of interest, ranking indeed among the most attractive features in Agricultural hall. The first of these is the pavilion of the Stollwerck brothers of Cologne, fashioned of chocolate and



PORTO RICO EXHIBIT

lective exhibit of their waters in a pavilion adorned with statuary, and provided with settees and easy chairs for invalids, and others seeking information. Baden-Baden, through its city committee on baths, presents views of that well known resort, with plans of its new bathing establishment. The royal Prussian bath at Ems, the cold and the hot sea water baths of Heligoland, the royal Bavarian baths, and the Harzburg Springs company, purveyors to the dukes of Edinburg and Saxe-Coburg-Gotha, with other noted sanatoria are also represented. In the northwestern portion of the annex are the exhibits of machinery for the treatment of mineral waters, with refrigerators and the apparatus used in breweries and distilleries. Such agricultural appliances as ploughs, scythes, potato-harvesters, and threshing machines, with fertilizers of various descriptions are also on exposition.



MEXICAN TOBACCO AND LIQUORS

in the form of a temple of the renaissance period. It is 38 feet in height, and in its construction were used 30,000 pounds of chocolate and cocoa butter, the latter giving to the structure the semblance of marble. Blocks of chocolate form the foundation, upon which rest fluted columns crowned, above the architrave, by the emblematic eagles of Germany, and surmounted by a dome, with the imperial crown as apex. In the midst of the temple is a heroic statue of Germania, modelled after the figure on the Niederwald monument, and sculptured from a solid mass of chocolate. On its pedestal are reliefs, more than life size, of the emperors William I, Frederick III, William II, Bismarck, Von Moltke, and other historic characters.

The other exhibit to which reference is made is also in the shape of a temple, its court containing an exposition of the industries which centre in a Strassfurt establishment for the mining of salt and potash deposits, and their manufacture into fertilizers. This is known as the German kali works, a large stand in the centre of the court showing samples of the deposits as mined and prepared for the use of agriculturists, while from a broad platform depend a number of charts explaining the composition of the product, and its uses in supplying potash, phosphoric acid, and nitrogen for impoverished soils. A series of photographs also shows the visitor the large works connected with this enterprise at Cologne, with their mines, manufacturing departments, and laboratories.

In the German section are also displays of many varieties of prepared food and drinks, several firms making a specialty of food preparations for infants. As in the Austrian section, mineral waters, cordials, and liqueurs, to say nothing of beers and malt extracts, are in liberal display. The proprietors of some thirty German resorts, at which are famous springs or baths, have a col-



MEXICAN WHEAT

Russia's exhibit, west of the French government section, demonstrates the varied resources of her vast empire, in the form of structures of flax, tow, and hemp from the Caspian region, raw silk and tobacco from her Transcaucasian domain, and grains of all kinds from her central and southern provinces of Europe. Wheat and oats are displayed in sheaves, and threshed grain in vessels fashioned in imitation of bronze, a large collection of the latter arranged in the form of a lofty tower. The manufacture of candles is a flourishing industry in Russia, the largest and those of most elaborate design being used in the ceremonies of the church, of which some fine



HENEQUIN PLANT, MEXICO

specimens are here on exposition, arranged in structural forms. There are several imperial factories for the refining of sugar from beets, all of which have samples of their products, the government of Kieff adding to this collection specimens of honeycomb and confectionery.

Of more than 1,000,000,000 acres of arable land contained in European Russia, at least 60 per cent is under crop, the total yield of all cereals for 1892 amounting to 1,700,000,000 bushels against nearly 3,000,000,000 for the United States. Within recent years nearly 7,000,000 of emancipated serfs have redeemed or paid for their land in labor or kind with government aid, the average holding of the peasantry not exceeding ten acres per capita. Ere long the most favorable outlet for the poorer class of agriculturists will be in central and southern Siberia, a region whose resources are as yet but little appreciated, though gaining in favor as the railroad, now approaching its eastern verge, lays open to settlement its vast and virgin expanse. What the western and Pacific states were to our own republic, that will Siberia become to the Russian empire at no very distant day.

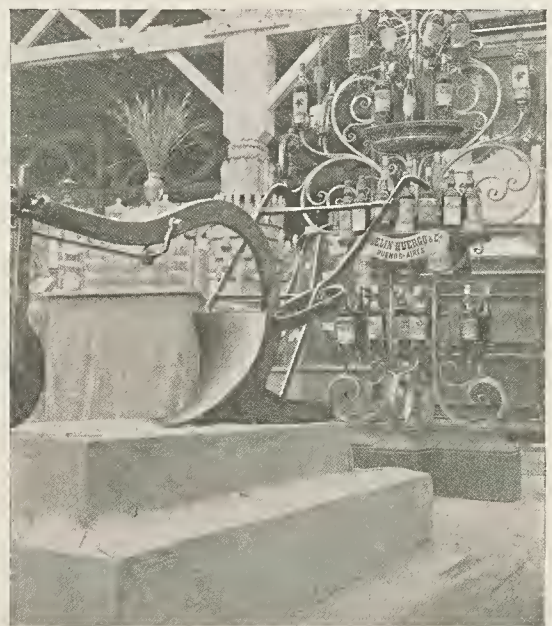


COTTON, BRAZIL

Italy occupies a small rectangular section in the southwestern portion of the main hall, adjacent to that of the agricultural colleges and experiment stations. Her display is of a somewhat miscellaneous character, including a large collection of olive oils and food preparations, as pastes, almond, and honey cakes, macaroni and cheese, chocolate, sugar, spices, sweetmeats, and liqueurs, with a few specimens of flax and hemp. Silk, one of her leading industries, with nearly 100,000,000 cocoons, gathered yearly from more than 5,000 cantons, and with 200,000 women and children employed in the treatment and manufacture of silk, is here represented by a single exhibit of larvæ. In line with the Italian group, but at the opposite side of the hall, and adjacent to the Virginia section, Greece shows her raw silks and olive oils, from various localities, with specimens of honey and honey-comb such as Attica produced long before Homer bethought him of the



IN THE BRAZILIAN SECTION



INTERIOR, ARGENTINIAN SECTION



COLUMBUS ARCH, PERISTYLE

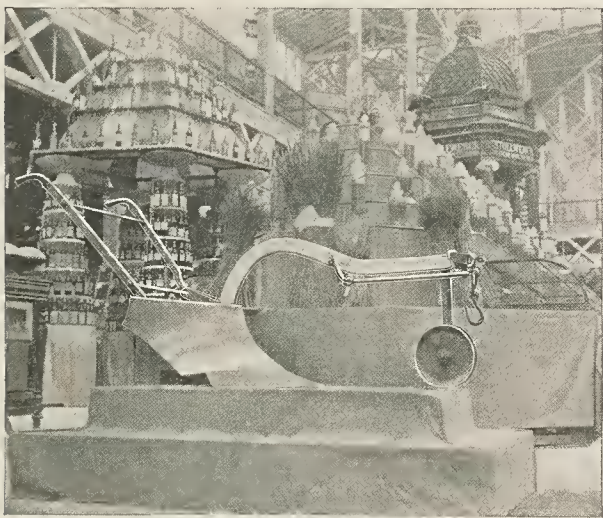
famous simile in which the Grecian hosts are likened to a swarm of bees covering the plains of Troy.

Holland, Sweden, and Denmark are grouped together in the northeastern portion of the hall, an Amsterdam chocolate house monopolizing most of the space allotted to the Netherlands. In its booth are dummies of life-like appearance, representing women and children about to receive their favorite beverage from the hands of a waiting maid. Somewhat of a curiosity is the Java kapok, a fibre used for bed-filling, and for which are claimed the advantages of remarkable elasticity and lightness.

Sweden illustrates her paper manufactures from wood pulp in the form of a small pavilion within her section, its base composed



MOUNTAIN HUT, BRAZIL



ARGENTINIAN WINES AND GRAINS

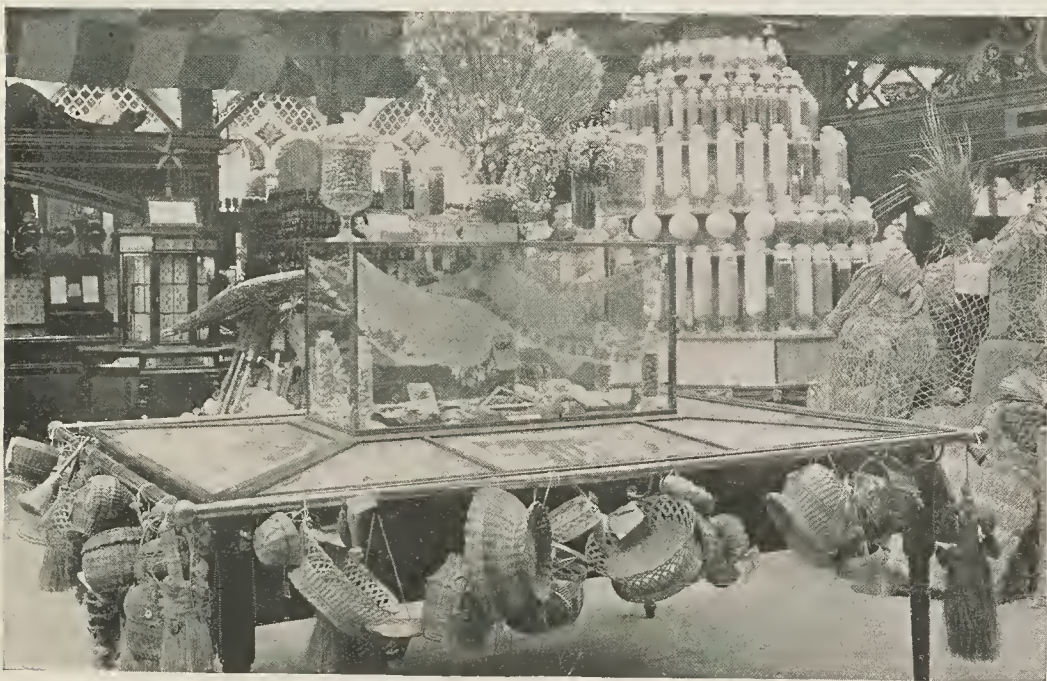
of segments of the trees generally used for the purpose, a large twisted column representing the finished product. Next to paper, Swedish punches, including such as are made of arrack, are the most prominent exhibits, while in the adjoining Danish collection the display of butter and a milking machine whose workings are illustrated on a model cow, are features not to be overlooked. In the latter is a booth filled with chocolate from a Copenhagen factory appointed as royal purveyor, and containing busts of the king of Denmark made of that article. The main entrance to the Danish pavilion represents a farmhouse, with high thatched roofs and broad gables, and with national types of women and

pastoral scenes depicted on panels in the outer walls.

Spain and the Philippine islands jointly occupy a pavilion west of the main northern portal. The exhibits of the former include summer, red, and winter wheat, with other grains, of which some are prepared for use in various forms. There are also preparations of food and drink, as soup, pastes, arrow-root, tapioca, confections, honey, and chocolate. Of alcoholic, vinous, mineral, and other beverages there are many samples, and in the group of olive oils are 100 specimens. Of wool there are a few assortments, and in the form of a hut are the fibres peculiar to



SOUTH AMERICAN PRODUCTS



BRAZILIAN BASKETS AND SILK COCOONS

Spain. Porto Rico of the Philippines sends an assortment of coffees, sugars, tobaccos, cigars, native woods, and curios. Near by is the booth of Trinidad, some of whose exhibits duplicate those of Porto Rico, but contain also collections of birds, with special native products and curiosities.

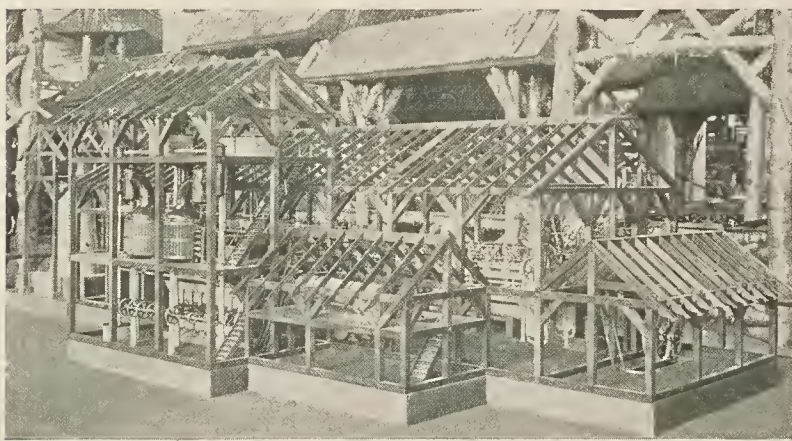


PARAGUAYAN EXHIBITS



ALLIGATOR AND SNAKE SKINS, PARAGUAY

varieties of seeds, spices, and grains are here on exposition, and there is a fair collection of the sheath-like fruit of the vanilla. Sugar made from the cane, and soap from cotton seed oil, represent important branches of industry, and there are specimens of wild cotton indigenous to Mexico. Samples of native drinks are plentiful,



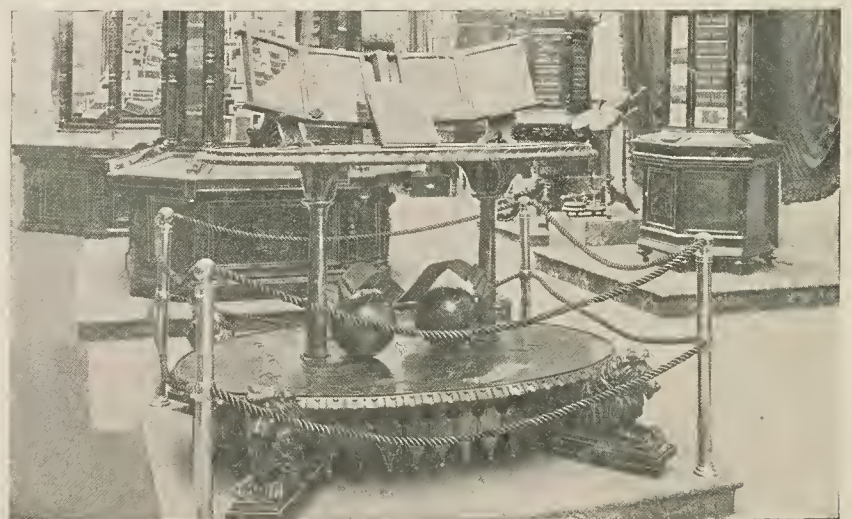
BEET ROOT SUGAR MILL, CUBA

including pulque and other liquors extracted from native plants, with such as are made from the orange, lemon, apple, pear, and peach. Richly decorated in green and gold is the pavilion of Brazil, with its attractive and varied display. Noticeable among the exhibits are pyramids of wool and tobacco, and a hut constructed of sections of fibrous plants, with hats of the same material arranged in the shape of festoons. There are also in various grades and forms coffee, sugar, silk, grasses, and manufactures of native fibres, with Brazilian wines and other beverages. The Argentine republic gives prominence to her

In the Cuban pavilion, the bulk of the exhibits consists of tobacco in leaf, or in the form of cigars, and sugars of various grades manufactured from the cane. Upon the wall are statements from chambers of commerce as to the production of these staples, and also of Cuban minerals.

Prominent among the exhibits of Latin-American countries are those of the Mexican section, and especially as to their collections of tobacco, fibres, and grains. Side by side with cigars and cigarettes is the raw material in leaves of phenomenal growth, while the fibres of the maguey plant are heaped in and around a huge central basin, and appear elsewhere in the form of rope, matting, and cloth. Some 2,000

stock-raising industries. Wool in the fleece and other forms is everywhere in this pavilion, one of the walls of which is almost covered with tanned hides and pelts. Of wines, sugars, and tobacco there is also a creditable display. Paraguay shows her medicinal plants outside of her section. Within are several samples of native tea, which there takes the place of the Chinese product, and is largely exported to other countries. Though not suited to American palates, it is a less injurious beverage than most of the varieties that Japan and China send forth. The exhibit indicates that Paraguay intends to make herself known as a tobacco-growing country. Here also is the cassava, or manioc



INTERIOR CUBAN EXHIBIT



JAPANESE PAVILION

root, from which tapioca is prepared. As this is a collective display, it includes articles of pottery, carved wood, canes made of native trees, laces, and other illustrations of industries and resources.

On the panels of Ecuador's miniature pavilion are depicted the governor's palace at Quito, and scenes typical of the republic. The exhibits include tapestries, porcelain, paintings, and wood and ivory carvings, the last of excellent workmanship.

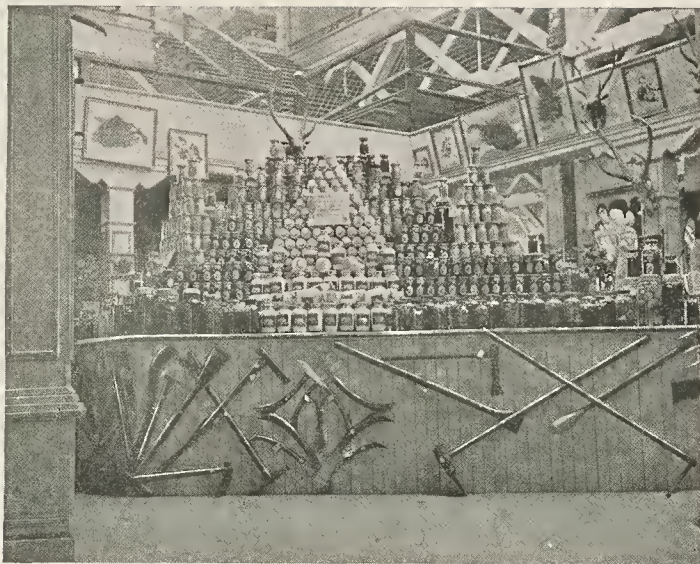
A model of a human skull, carved from wood, and skilfully colored, is a remarkable specimen of imitative skill. Among manufactured articles—for this is also a collective display—may be mentioned boots and shoes, saddlery, hats, clothing, and tinware. There is a small collection of native woods, and curios and relics are plentiful, including a few primitive agricultural implements, and costumes of Indians.

In the northeastern portion of Agricultural hall, Uruguay has an ambitious display, representing many branches of her industries and arts. In the centre of her pavilion is a column of dark wood, erected by the Liebig Extract of Beef company, whose works and yards at Fray-Bentos are probably the largest industrial establishment in South America. Around it are bottles of the extract, and photographs of the factory and grounds, with specimens of candles and soaps in a case adjacent. Elsewhere are fleeces and piles of long silky wool, with all the grains of the temperate zone, with liqueurs and mineral waters, minerals and woods, and collections of paintings, books, and specimens of work from pupils of the public schools.

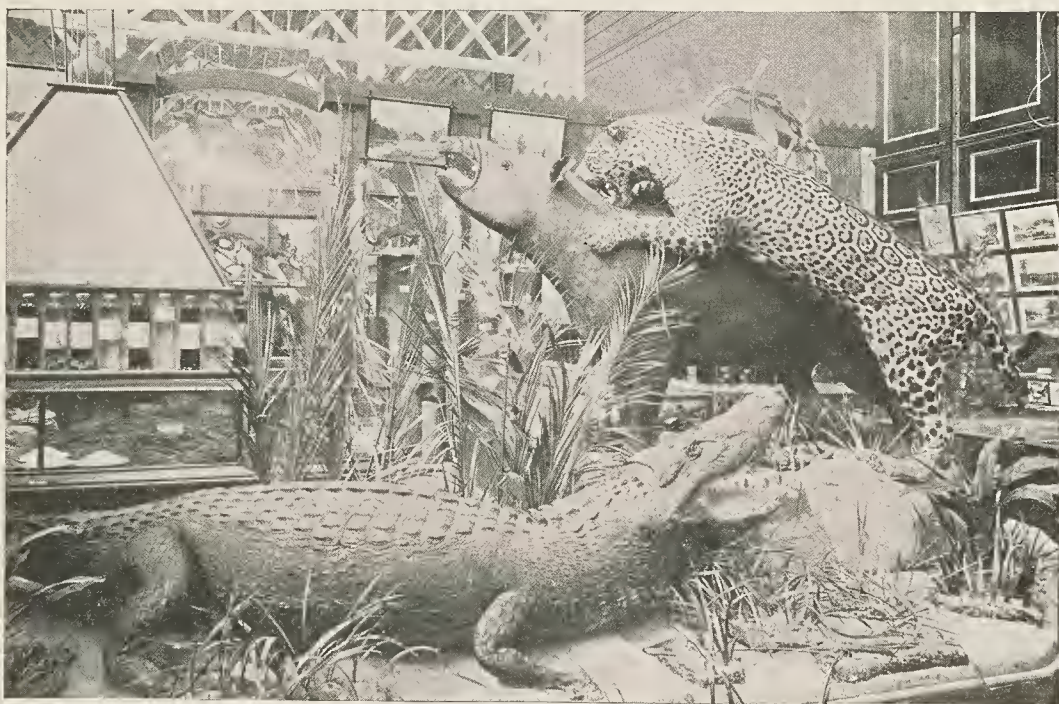
Among the pictures, one of the most remarkable represents a young mother, drawing aside the coverlet from a sleeping infant, her hand upraised in a gesture of warning. The educational exhibits abound in specimens of kindergarten work, and there are many illustrations of proficiency from pupils of the higher schools, conducted jointly by the government and the catholic church.

South of the Mexican section is the Japanese pavilion of bamboo and matting, its outer walls adorned

with green panels of the latter material. The exhibits of tea, with photographs illustrating the methods of picking and packing, are of special interest to the people of the United States, who consume so large proportion of this product. Jars and boxes of rice and vermicelli, leaf tobacco and cigars, wax made from berries as well as the more common kind, plantain fibre, hemp, and matting are also on exposition. There is a large assortment of cocoons, and among other curiosities are gourds made of snake skins. Brandy manufactured from rice, beers and vinegars, fish sauces, and other condiments and beverages, some of them peculiar to the country, are arranged side by side with canned salmon, trout, beef, lobsters, oysters, and sardines.



JAPANESE CANNED GOODS



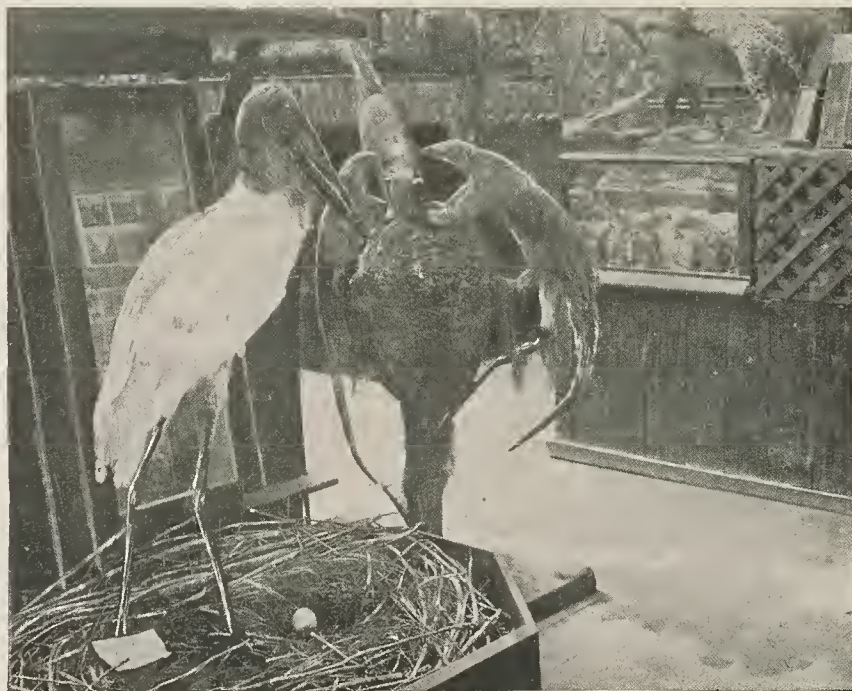
ALLIGATOR, TAPIR, AND JAGUAR, BRITISH GUIANA



ANT EATER, BRITISH GUIANA

An attractive feature is the collection of birds and fowls, including such as are found in forest and on farm, and those which are used for food. Among them are bantams and Siamese chickens, and mounted on high in a coop is a pair of long-tailed fowls, one of which has an appendage more than ten feet in length. In the pictures scattered throughout the pavilion are illustrated tea plantations and processes, together with many ingenious devices whereby the Japanese ensnare the birds of forest, field, river, and lake. These include decoy birds hung in cages, nets attached to long bamboo poles, and limed ropes stretched over the water, all of which are represented in graphic art.

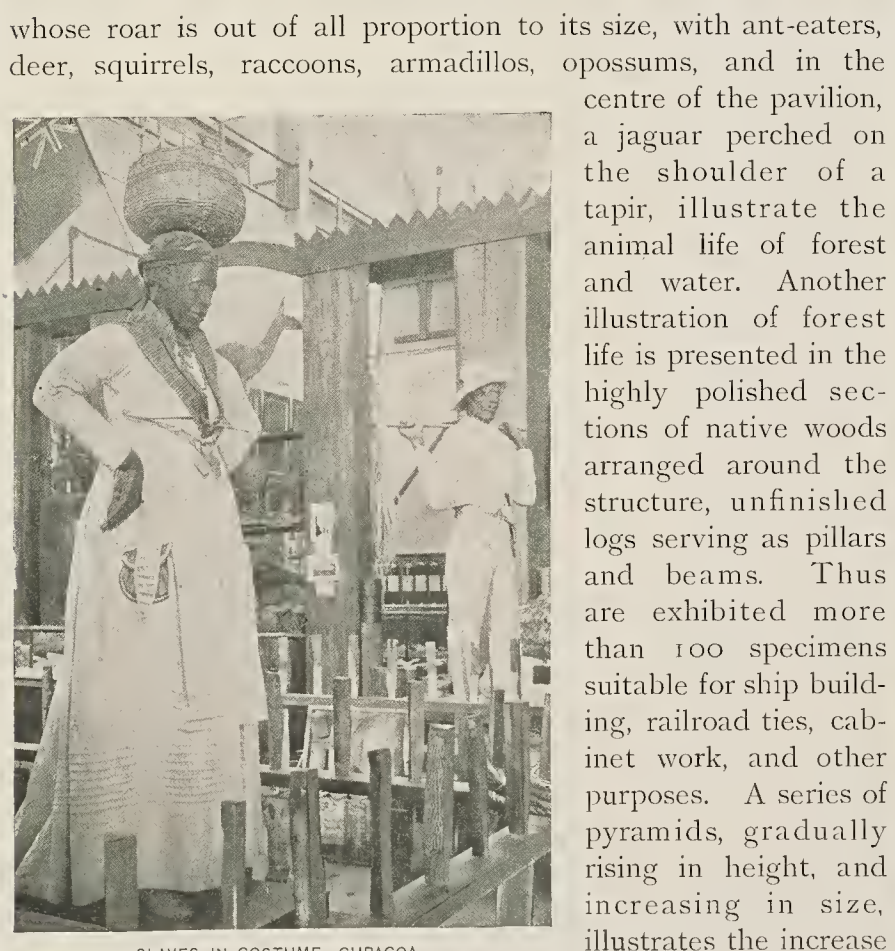
British Guiana and Curacao, the latter a small colony of the Dutch West Indies, have small adjoining exhibits in the northwestern corner of the hall, in which are brought together many forms



STORK AND ANT EATER, BRITISH GUIANA



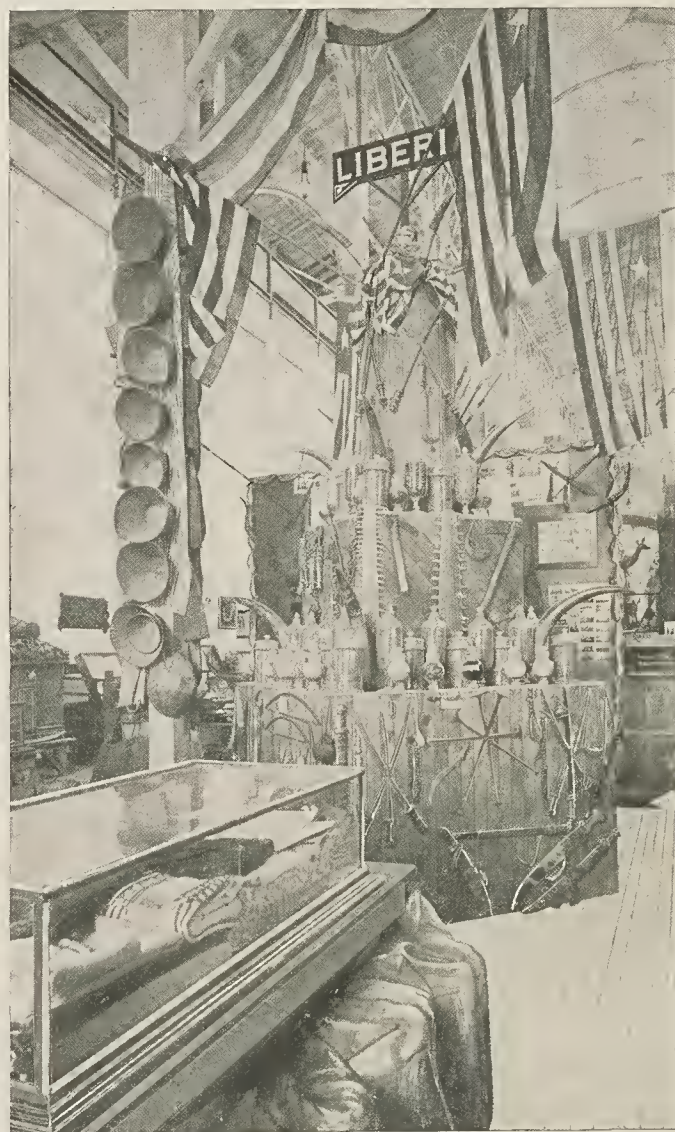
MONKEYS, BRITISH GUIANA



SLAVES IN COSTUME, CURACOA

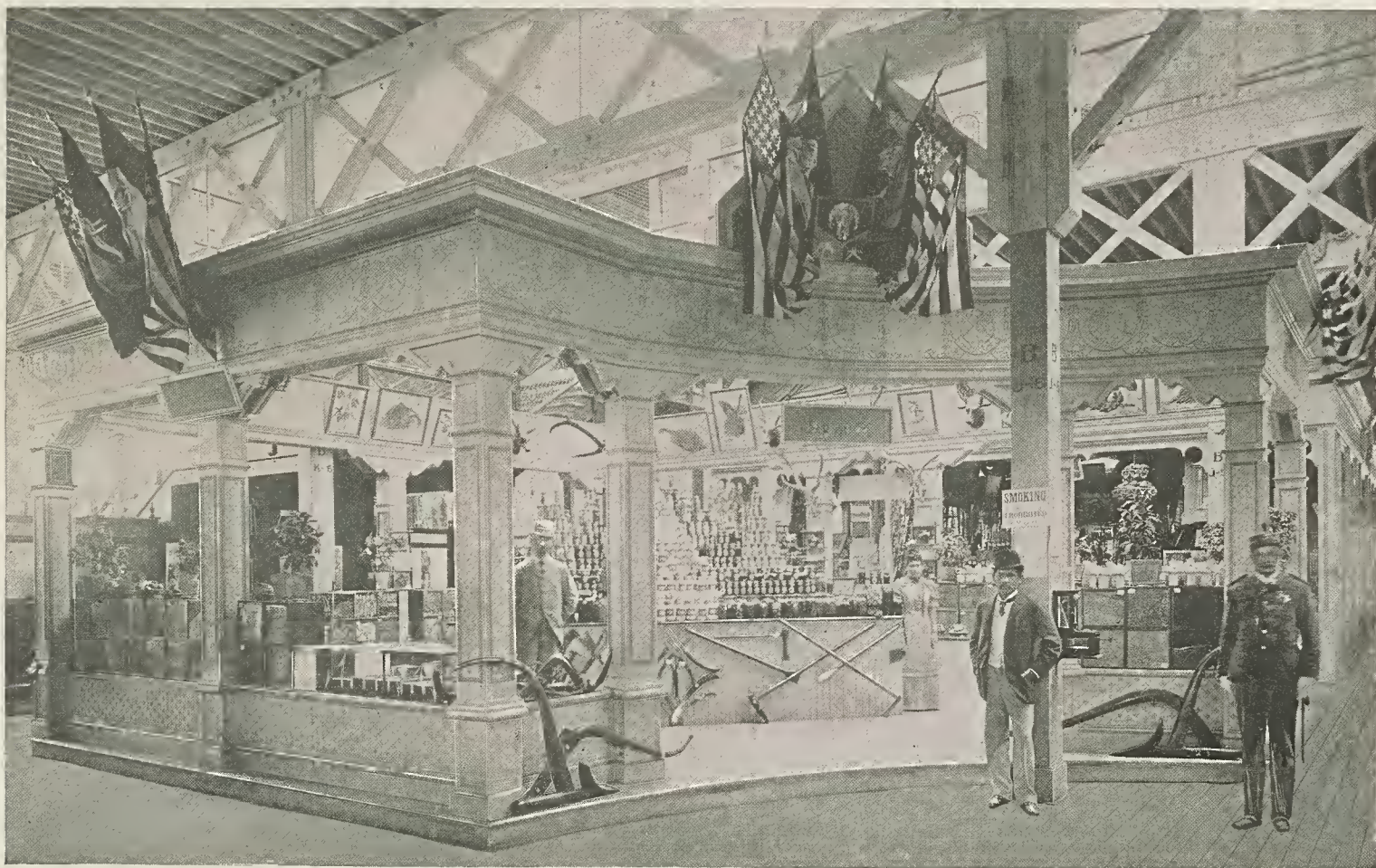
of wild and civilized life. A case in the latter section contains the antiquities of Carib tribes, and near it is a burial urn of clay. Among other curiosities are samples of shell and feather-work, whose bright colors stand forth in strong relief.

British Guiana has a more elaborate display, as befits her resources and commercial importance. Birds of brilliant plumage, crabs, turtles, sword-fish, a sea cow, an alligator, a so-called bear howler,



LIBERIAN SECTION

illustrates the increase



SIAMESE PAVILION

in the production of gold from 1884, when the entire yield was but 250 ounces, to 1892, when the export was nearly one hundred times as much.

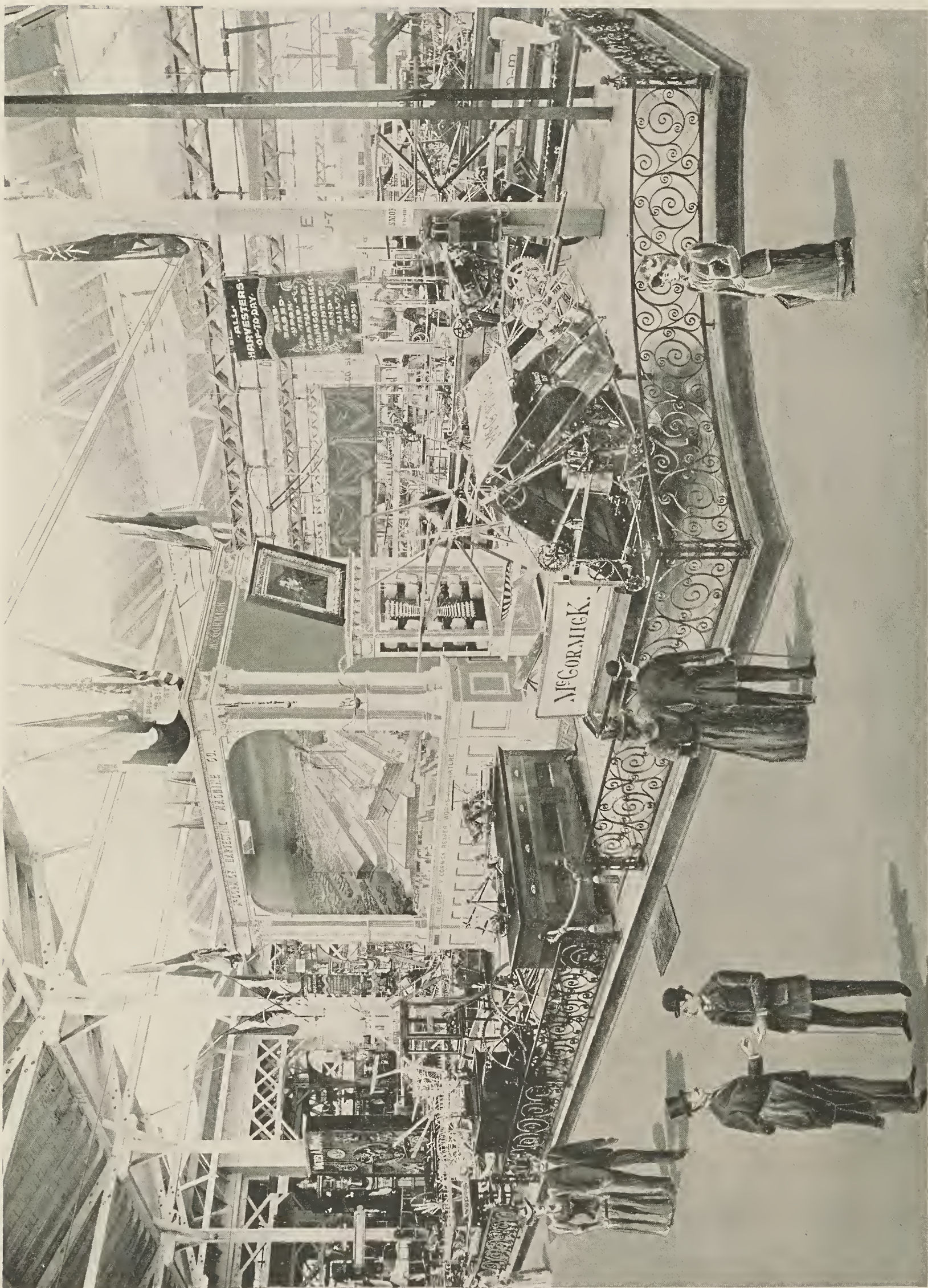
Johore, in the southern extremity of the Malay peninsula, has a tasteful pavilion between the Brazilian and Mexican sections. From the main entrance floats the star and crescent, and near it, within the booth, is a large bust of the sultan, with photographs of his palace, and the scenery of his dominion. On one side are specimens of printing from the imperial establishment at Singapore, and on the other, books and charts from the native schools, with a heavy wooden block to which the rebellious pupil is chained. The exhibits include samples of coffee, tea, copal, rice, sweetmeats, betel nuts, spices, sago, rattan, and preserved fruits, the last including a species of plum, which, as is claimed, is the most luscious of all the fruits. There are also shown the various tools by which the pith is extracted from the palm, grated into powder, and kneaded with water, in the preparation of sago flour, several jars being filled with sago cakes. Ranged along one of the outer walls are groups of agricultural implements, and strung beneath the cornice is the dried skin of a huge boa constrictor.

The forest wealth of Johore is illustrated in another portion of the hall by polished sections of native woods, and by a large and beautifully carved model of the royal residence, with the dining room and kitchen which connect with it. Here also are sheets of the reddish substance stripped from the inner bark of a native tree, and largely used for clothing.

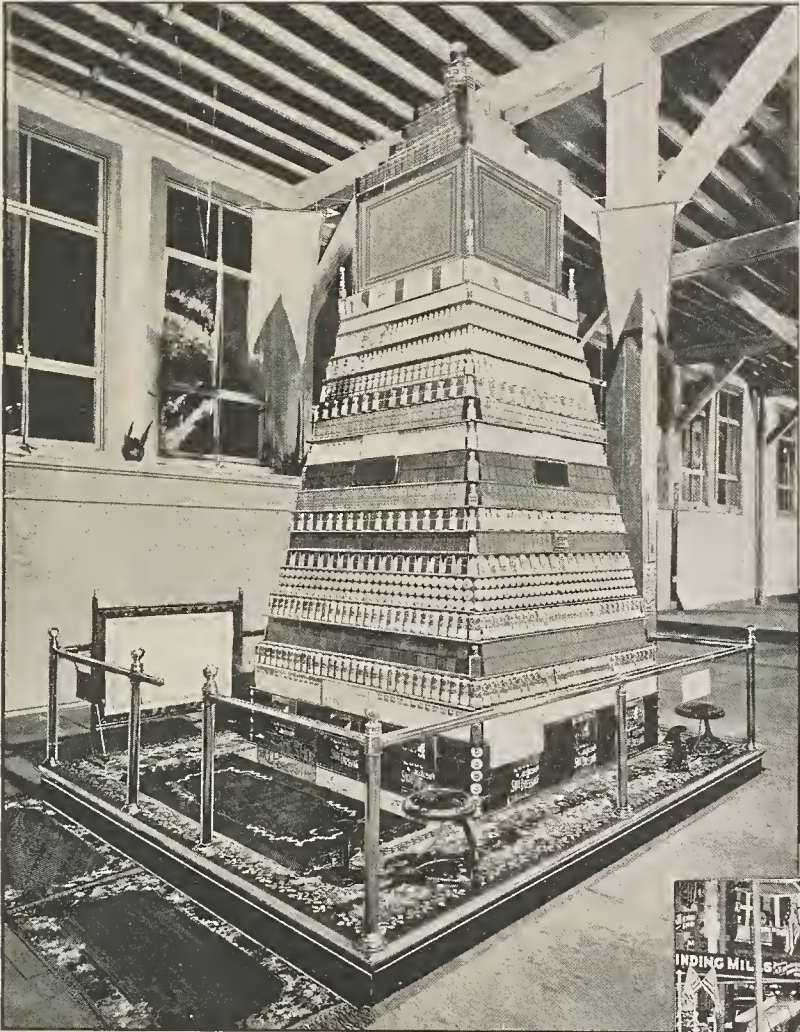
In the centre of the United States pavilions is a Persian exhibit of rugs, tapestries, ceramics, brass-ware, and wood-carvings. The fabrics come from all the industrial centres of the empire, some fashioned almost entirely of silk, and others of the wool of the Angora goat. Brilliant colors seem to be in disfavor, deep blues and yellows being mostly used, except for the silken rugs of Shiraz with their changing hues, and those of Khorassan dyed in brilliant carmine. Gold and silver embroideries



ORANGE FREE STATE



REAPER EXHIBIT AGRICULTURAL BUILDING

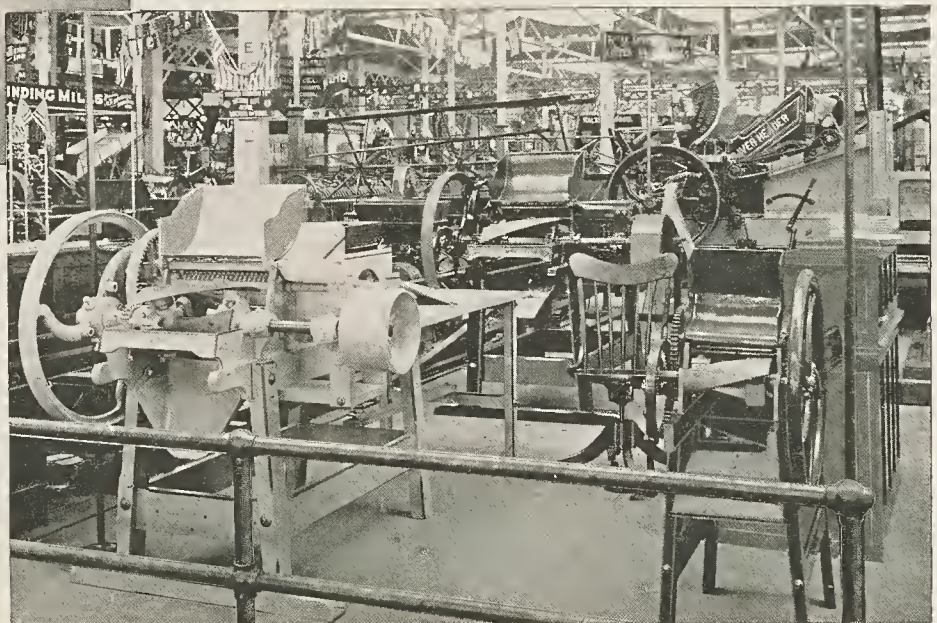


OIL PYRAMID

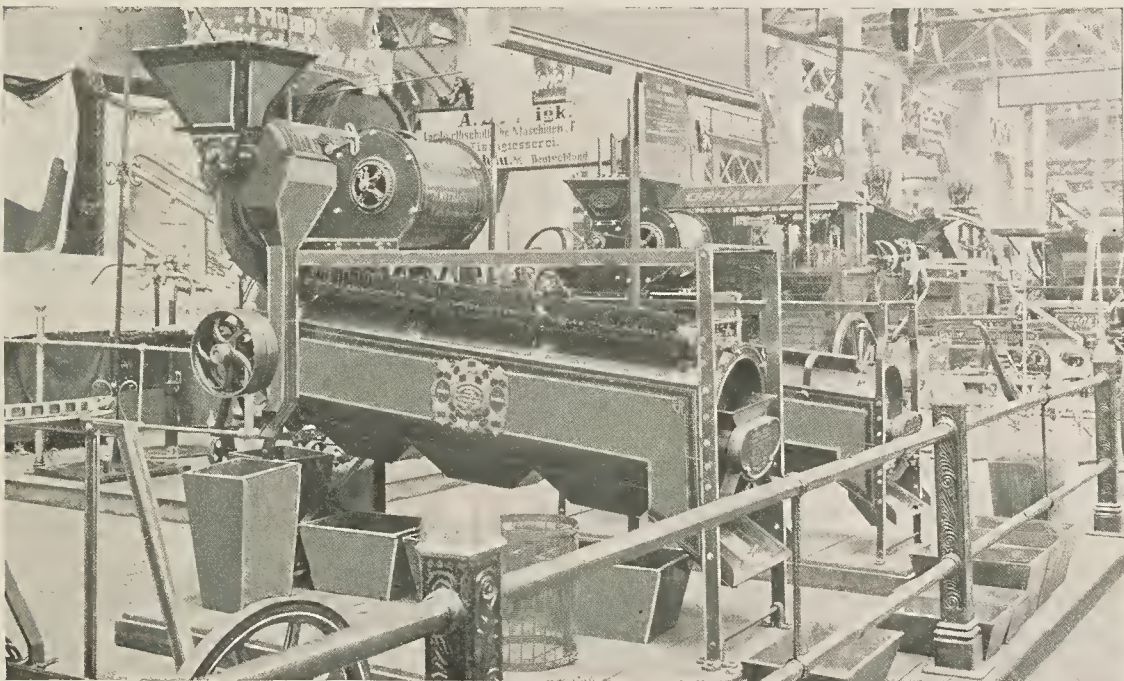
ing, and curios illustrative of life in Liberia, there are bracelets of iron, brass, and copper, leather bags and water bottles, blue and white cloths, warriors' caps, and women's skirts and head-dresses of grass, with leather charms, hideous wooden idols, spears, swords, daggers, and dirks, looms, inkstands, pens, bars of iron, wooden sandals, embroidered gowns, hammocks of cloth, yarn, and grass, powder horns, photographs, postage stamps, postal cards, metal and paper money, newspapers and books, strainers for palm butter, palm

and several specimens of rich jewelry work are also on exposition; but more precious than these is a translation of the entire Koran written on tiny parchment leaves, and enclosed in a small box which could be easily carried in the pocket.

In the extreme northwest corner of the main building is the Liberian exhibit, which, though small in size, displays to excellent advantage the resources of the West African republic. Two immense horns form an arch to the chief entrance of the pavilion. Animal life is here in many forms. There are horns of cows, of antelope, elk, and deer, tusks of elephant and hippopotamus, and in the background is grouped a large collection of the skins of deer, monkeys, squirrels, tiger-cats, leopards, otters, coons, and snakes. Heads of different animals protrude from the walls, and more strange than all else is the miniature hippopotamus mounted upon a table. Until its capture in Liberia, a few years ago, this was believed to be an extinct species, and to-day there are only two other mounted specimens in existence, one in Paris, and the other in London. As to implements, weapons, cloth-



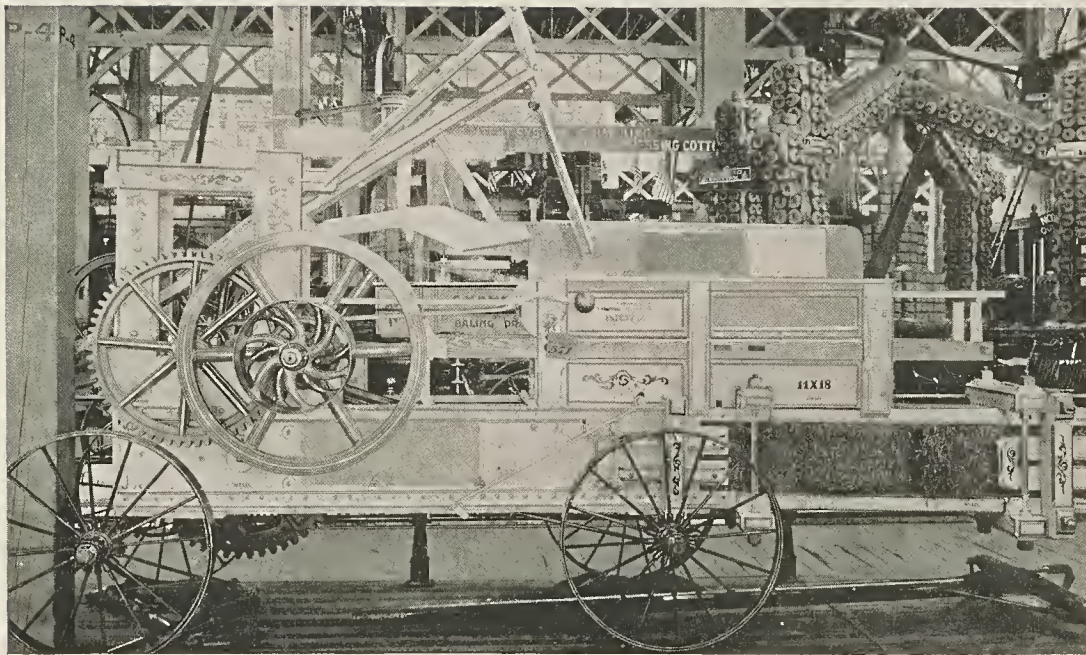
FODDER CUTTING MACHINE



CORN SHELLERS

oil gourds, blacksmiths' tools, and bellows, chairs, stools, and trunks of bamboo, fishing nets and baskets, and fine needlework. Among the last is an embroidered satin quilt, upon which is represented in raised work a coffee tree in full bloom.

From an enumeration of the articles displayed, it would be inferred that Liberia is still a country of tribal distinctions, as well as a community of civilized and intelligent people. The contrast in the social conditions of the republic is illustrated in a reproduction of the bamboo hut, thatched with

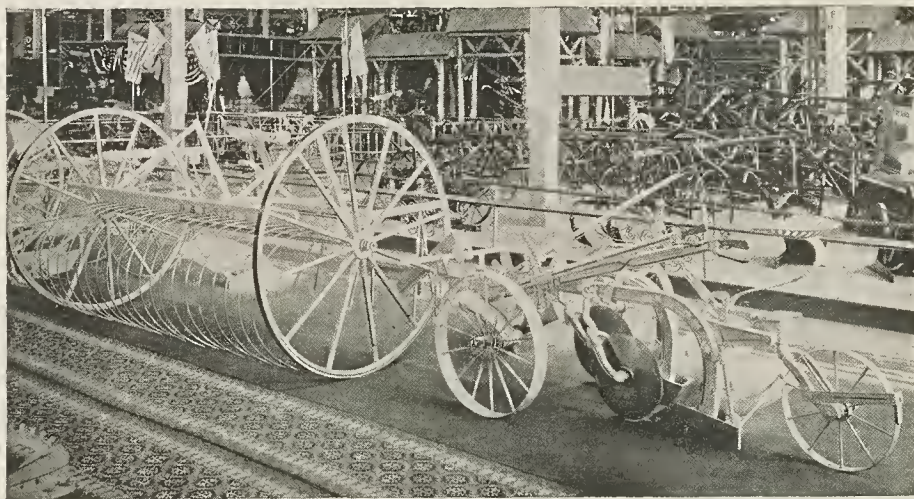


BALING PRESS FOR HAY AND STRAW

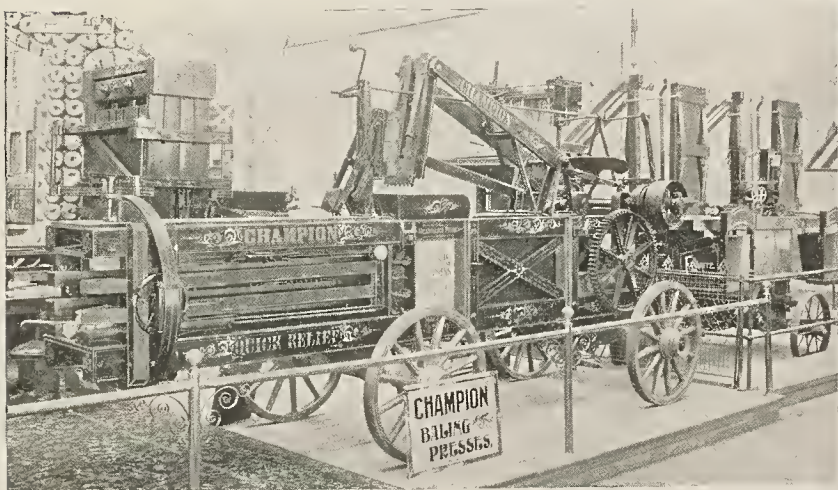
glistens near the entrance, and in the interior is a structure composed of jars of grain surmounted by a native deer. Near the Mexican section Siam has a booth containing grains, tobacco, edible birds-nests, and models of primitive vehicles and agricultural implements.

Along the aisle which separates Agricultural hall from its annex, are the collective exhibits of seeds, oils, and packing industries. Several of the first are housed in attractive pavilions; but as the main collection of their exhibitors is in the Horticultural building, this is by comparison a minor display. Among packing houses, however, such firms as Armour and company, Swift and company, and others of world-wide repute, not only show manufactured products, as butterine, stearine, lards, and oils, but also their methods of packing, preserving, and transporting meats. One firm exhibits a model refrigerator car, with glass sides, its contents neatly arranged for shipment. The hog is seen in all postures, and fashioned of many materials. One group contains a stuffed animal in a gilded chariot, with shoats in place of steeds; in another is a huge hog made of lard, with spectacles on snout, and pen and inkstand beside him, while a third exhibitor symbolizes perhaps the prosperity which pork has brought him in the form of a group of golden pigs around one of the pillars of his pavilion.

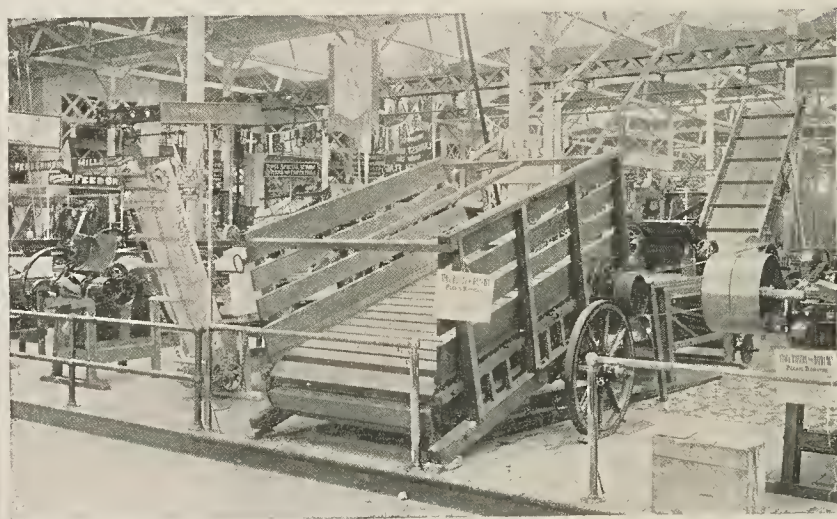
The American Cotton Oil company, of New York, has a structure in this vicinity, in the shape of a circular colonnade of Corinthian pillars, joined by metallic garlands which meet in the centre, and support an American eagle perched on a globe, the entire composition resembling frosted silver. Opposite is one of somewhat similar



HAY RAKE



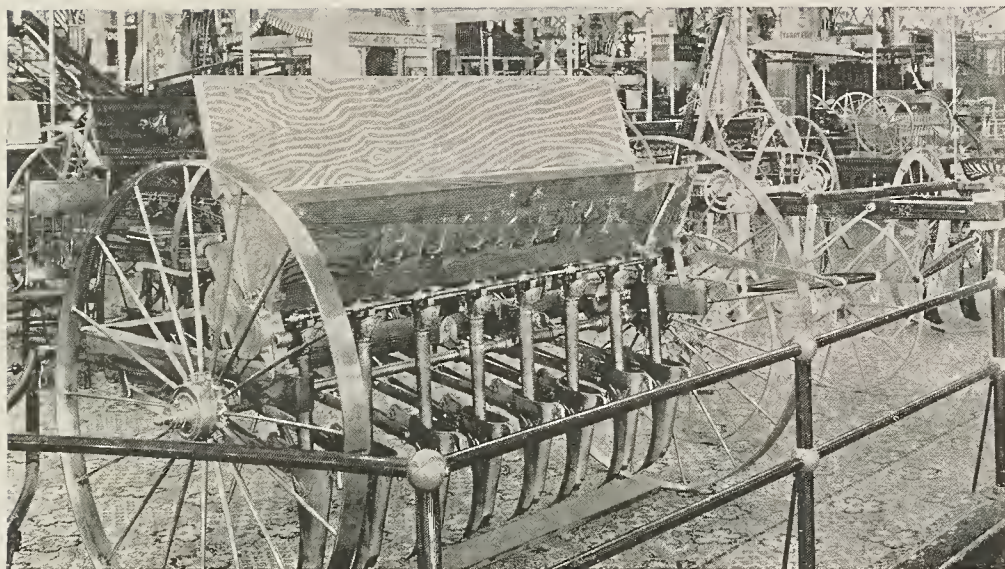
BALING PRESS



FODDER CUTTER

palm leaves, and the modern Liberian house, with its two stories and attic, surrounded by wide verandahs, and containing spacious halls, and airy cheerful rooms. Among the exhibits which show the products of the country and its growing commerce, may be mentioned coffee in bags and jars, sacks of cocoa, and of red, blue, and yellow dyes, bundles of fibres of the bamboo and plantain, boxes of iron ore and ivory, barrels of palm and nut oils, bunches of rice, and cases of crude rubber.

The Orange Free State has an attractive home in the southwestern portion of the hall, decorated with skins, pelts, and ostrich plumes. A case of rough diamonds



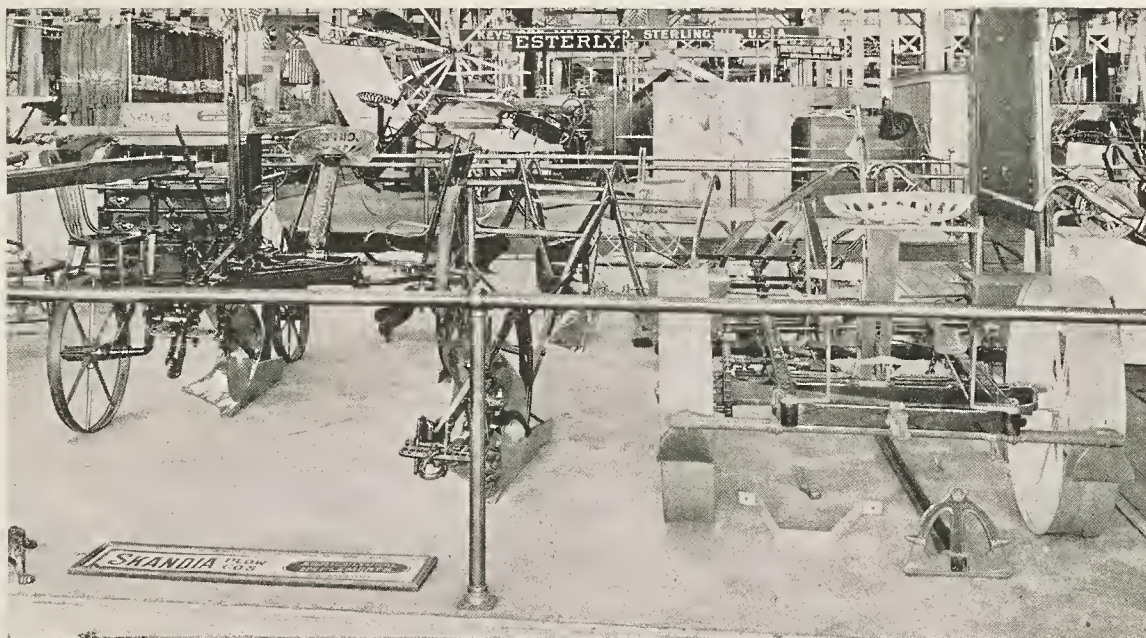
BUCKEYE DRILL



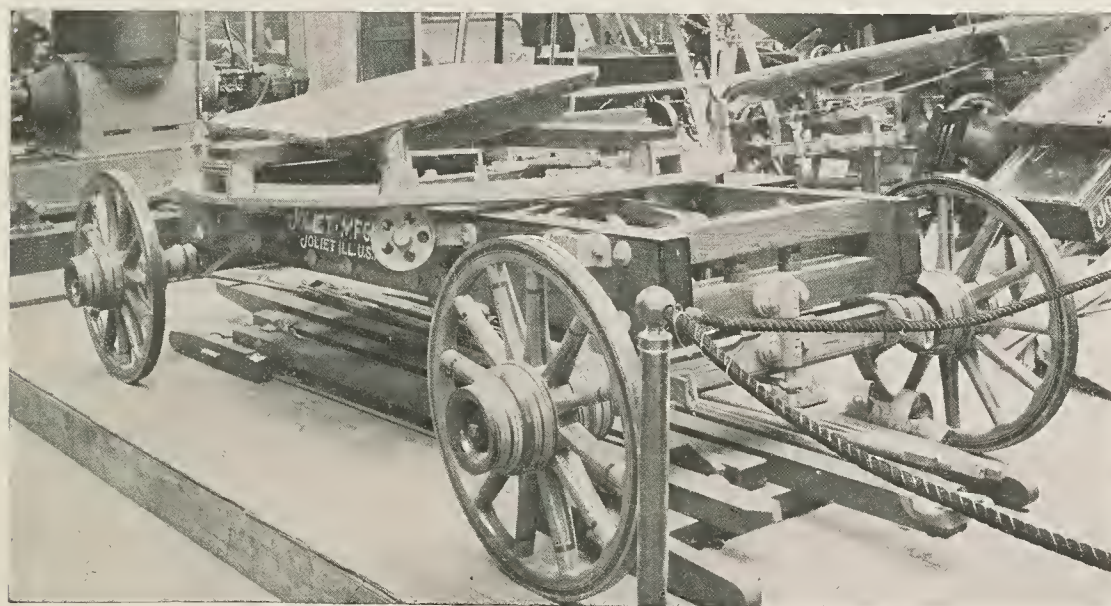
CULTIVATOR

design, representing one of the company's departments transacting business under another name, and manufacturing a preparation of cottonseed oil and beef fat known as cottolene.

In the northern portion of the annex, Canada, France, Germany, and Russia have a collection of agricultural machinery, together with such as is used for manufacturing farm products into food and other preparations. Apart from these, the annex is mainly occupied by the collective exhibit of the United States, Illinois, New York, Ohio, Iowa, Minnesota, Wisconsin, and Michigan, combining to present a forcible illustration of American ingenuity and industry. From the special forms of agriculture developed in various sections of the country have been evolved the hundreds of machines here placed on exhibition. Among them are the plows used on prairie lands, and such as are specially constructed for the cultivation of hill-sides. There are harrows and pulverizers, threshing machines and separators, reapers and binders, fanning mills and feed cutters, mowers and drills, grain measures and baggers, straw stackers, stump extractors, hay cutters and rakes, manure spreaders, and presses for hay, straw, cotton, and fibre. There are also such special appliances as the potato planter, digger, picker, and loader, the corn and pea sheller, the rice and coffee huller, the tobacco huller, the oat clipper, the grape and berry hoe, the horse clipper, and sheep shearer.



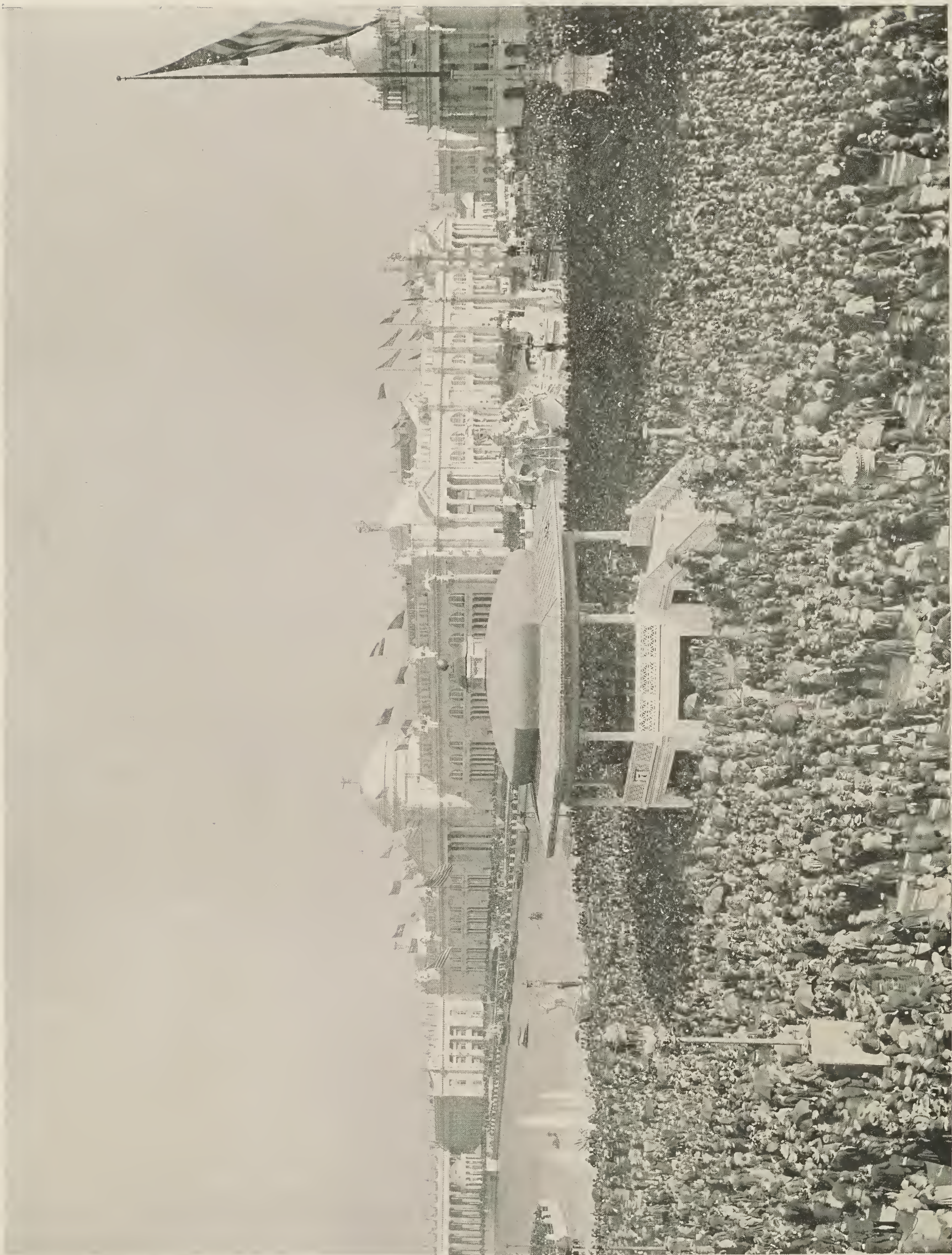
CORN PLANTER AND PLOUGHS



HORSE-POWER CORN SHELLER

There are also such special appliances as the potato planter, digger, picker, and loader, the corn and pea sheller, the rice and coffee huller, the tobacco huller, the oat clipper, the grape and berry hoe, the horse clipper, and sheep shearer.

A mere enumeration of the more prominent groups and special apparatus contained in the annex is a sufficient excuse for omitting descriptive detail,



ADMINISTRATION PLAZA CHICAGO DAY

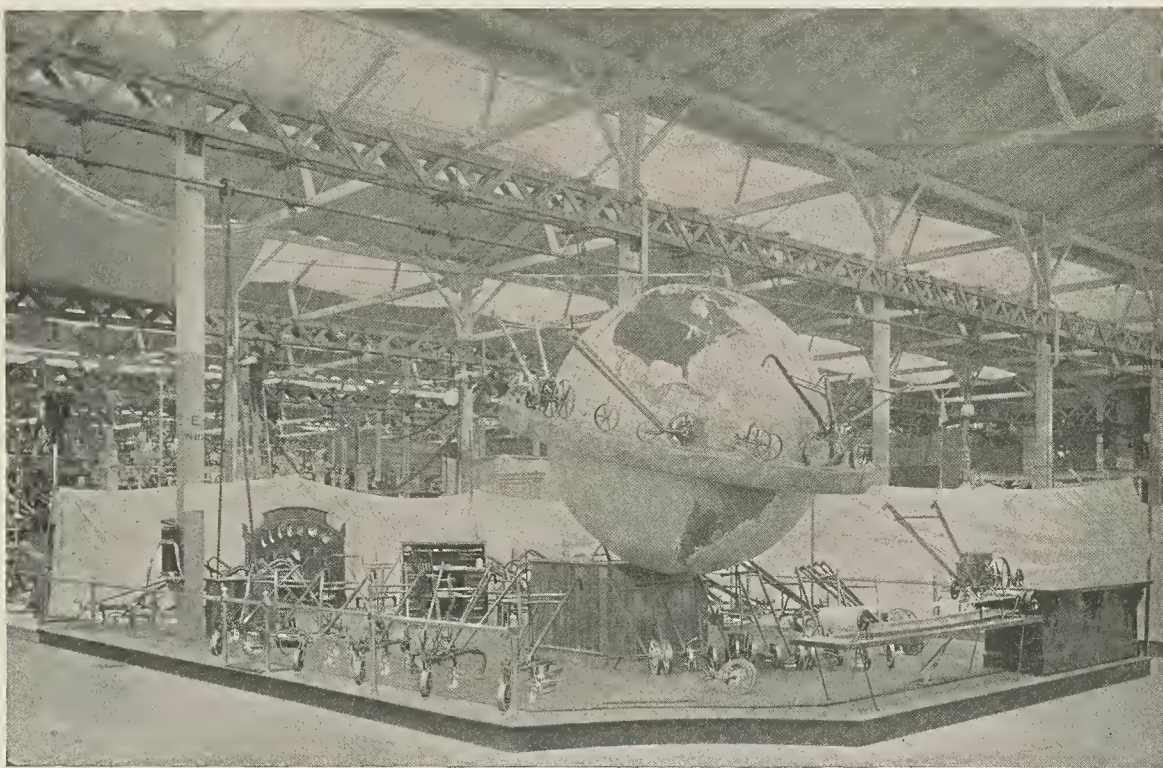
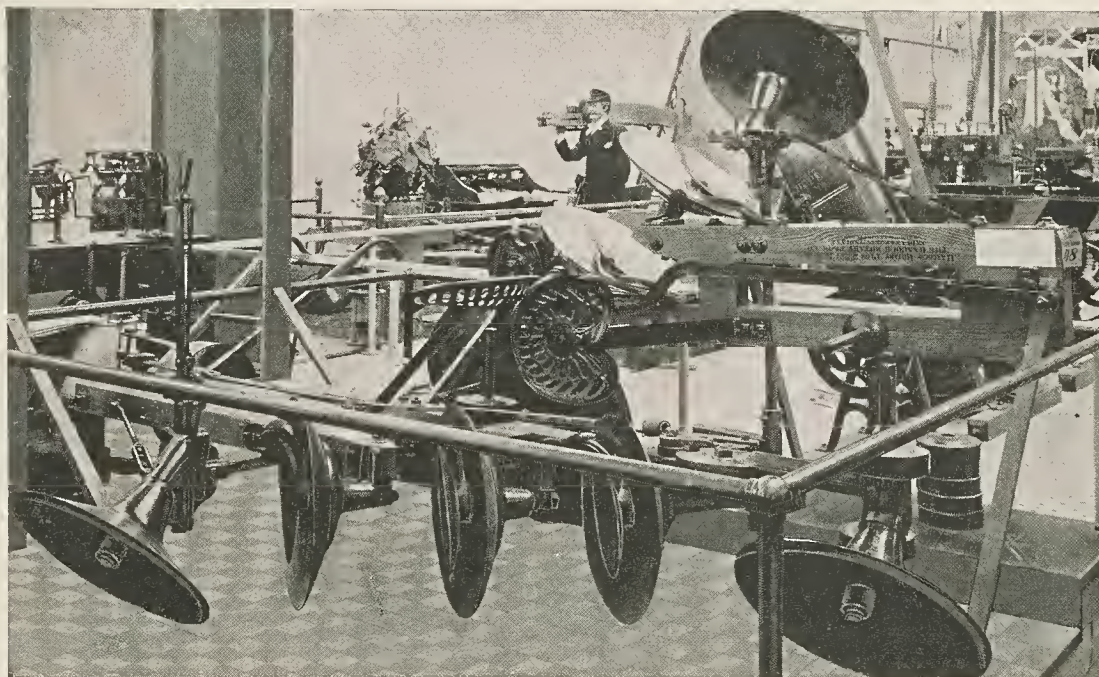


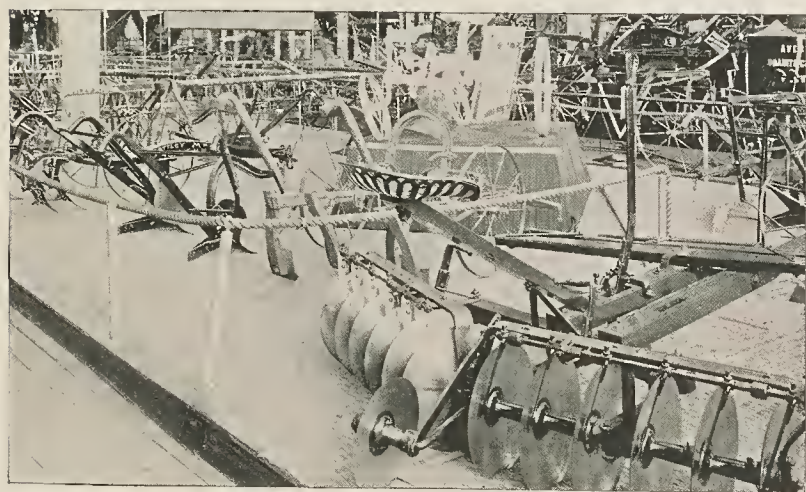
EXHIBIT OF PLOUGHS

models, showing the processes of development in the McCormick machine, and forming with others, a complete illustration of the progress and preëminence of the United States in the manufacture of agricultural machinery.

Side by side with the perfected mechanisms of the present day is the model of the first practical reaper invented by Cyrus H. McCormick in 1831, and in the summer of that year, worked with excellent results in a field of oats at Walnut Grove, Virginia. He was then only twenty-one years of age, but inheriting from his father, Robert McCormick, a taste and gift for invention, took up his work on the reaper after observing the failure of previous attempts made by the latter. Hence his name was deemed worthy of a place among those of the great inventors and discoverers inscribed on the frieze of Machinery hall, for in his original reaper were embodied the fundamental principles on which all reapers and harvesters have since been made.



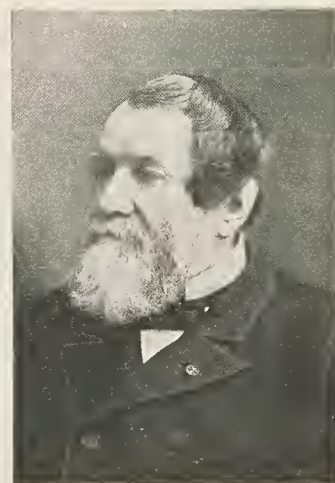
ROTARY PLOUGHS



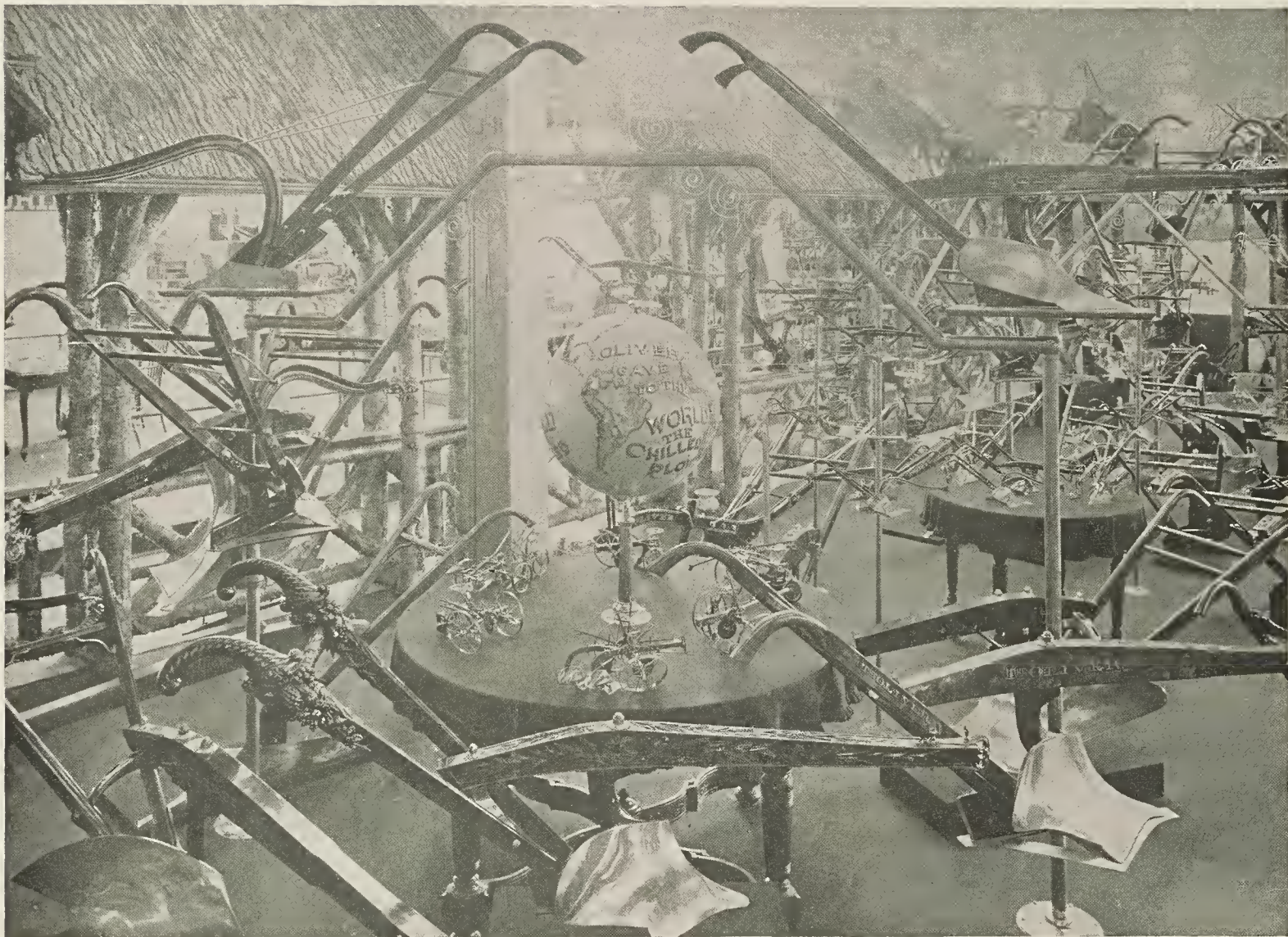
HARROWS AND PLOUGHS

and it is almost unnecessary to say more than that the foremost of American manufacturers have placed their choicest specimens on exposition. Among the more noticeable exhibits is that of the McCormick Harvesting Machine company of Chicago, who are the largest manufacturers of their kind in the world. Their exhibits consist of harvesters, binders, mowers, and reapers, the first including rice and corn harvesters, and all of them extensively used, not only in the United States, but in foreign lands, wherever grains and grasses will grow. In the patent office exhibit of the Government department, there is a series of

An interesting feature is the panoramic illustration of the growth of the company's business. The story is depicted upon opposite sides of a screen, one showing the old fashioned blacksmith shop in Virginia, where Cyrus H. McCormick forged the iron works for his first reaping machine, and the other the Chicago works as they appeared in 1893, with their forty acres of factories, warehouses, and yards, with trains running to and fro, and vessels

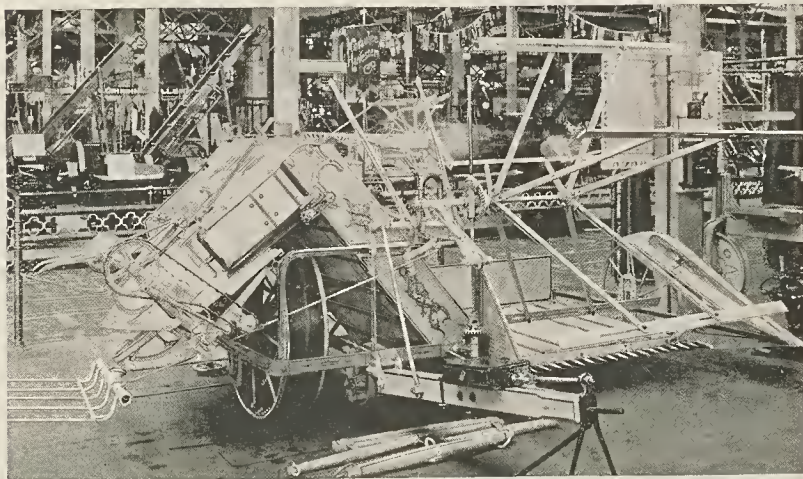


CYRUS H. McCORMICK

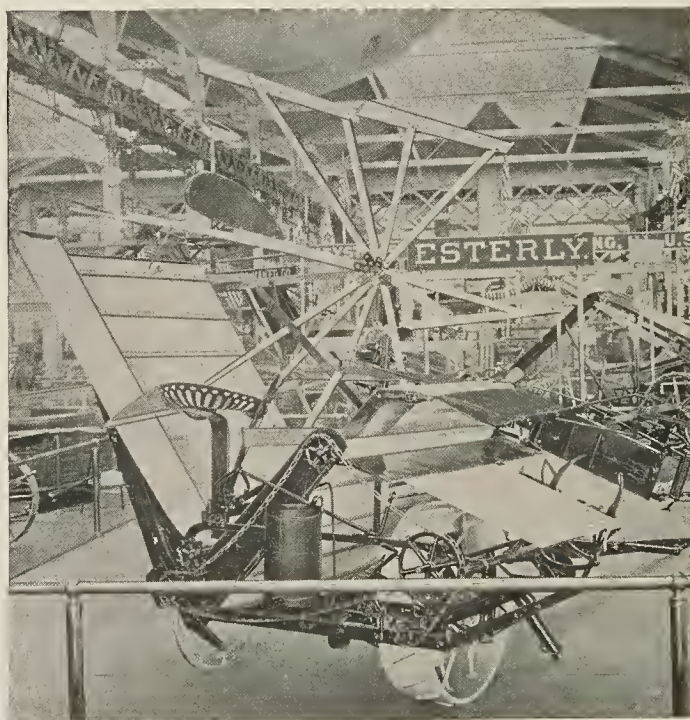


OLIVER PLOUGH EXHIBIT

loading and unloading at the docks. Here also are the medals and other recognitions, awarded at former international expositions, beginning with the gold medal of the American institute, bestowed in 1845, and including those which were granted at the London Expositions of 1851 and 1862, the Paris Fairs of 1855, 1867, 1878, and 1889, and the Philadelphia Exposition of 1876. Especially were the merits of the McCormick reaper recognized at the London Exhibition of 1851, at which day a novelty to British manufacturers and agriculturists. Even the *London Times*, which had before described it as "a cross between an Astley chariot, a wheel-barrow, and a flying machine," made amends by pronouncing it to be the most valuable article in the Exhibition, and one that of itself would almost repay its entire cost. Said the commissioner of patents in his report for 1849: "In agriculture it is, in my view, as important a labor saving device as the spinning-jenny and power loom in manufactures. It is one of those great and valuable inventions which commence a new era in the progress of improvement, and whose beneficial influence is felt in all coming time."

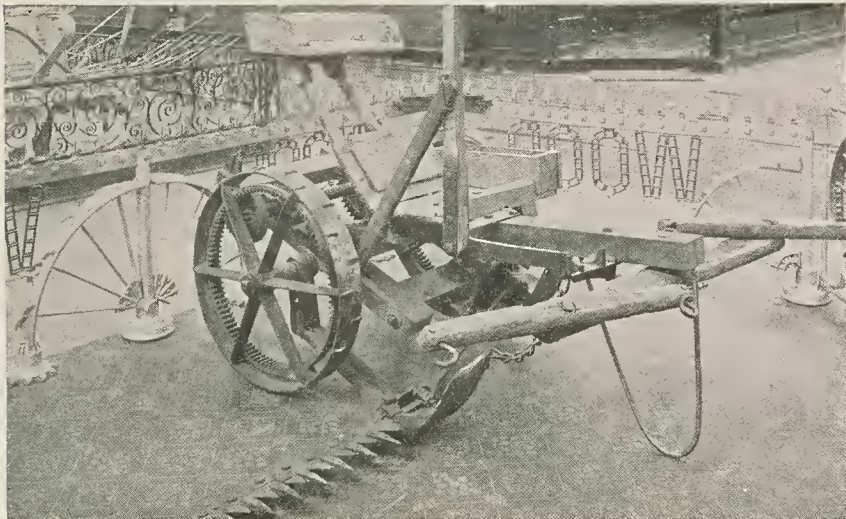


HARVESTER AND BINDER

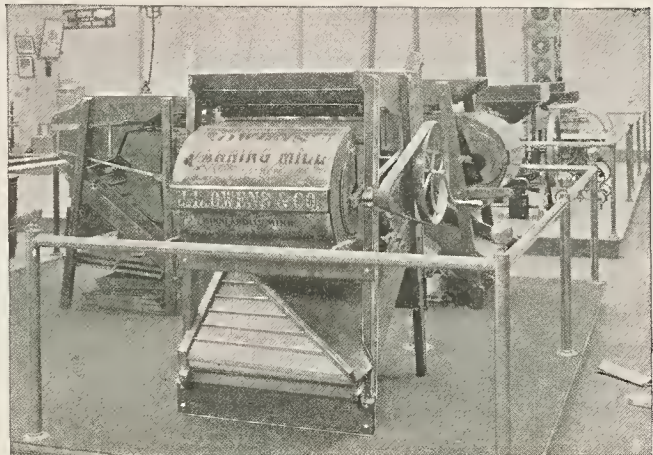


HARVESTER

The Chicago firm of William Deering and company has a creditable display of harvesting machinery, this firm claiming to be the original makers of what are termed elevator harvesters and automatic twine binders. The Moline Plow company of Illinois, with one of the largest factories of the kind in existence, has a spacious pavilion, the central figure of its exhibit being a mammoth bronze statue of a Dutchman, with outspread wings, typical of its Flying Dutchman sulky plough. Other establishments have also attractive headquarters, especially those which occupy a large group of pavilions of tasteful rustic design. A Philadelphia house which manufactures garden implements, groups its specialties on a platform surrounding the equatorial line of a huge revolving globe. Here are machines for sowing the seed, and fertilizing



OLD FASHIONED MOWER

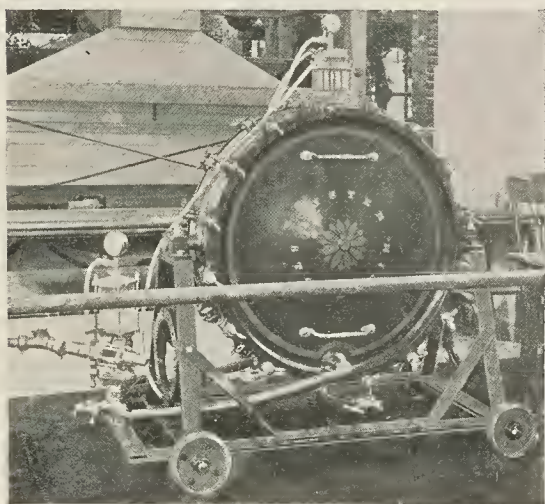


FANNING MILL

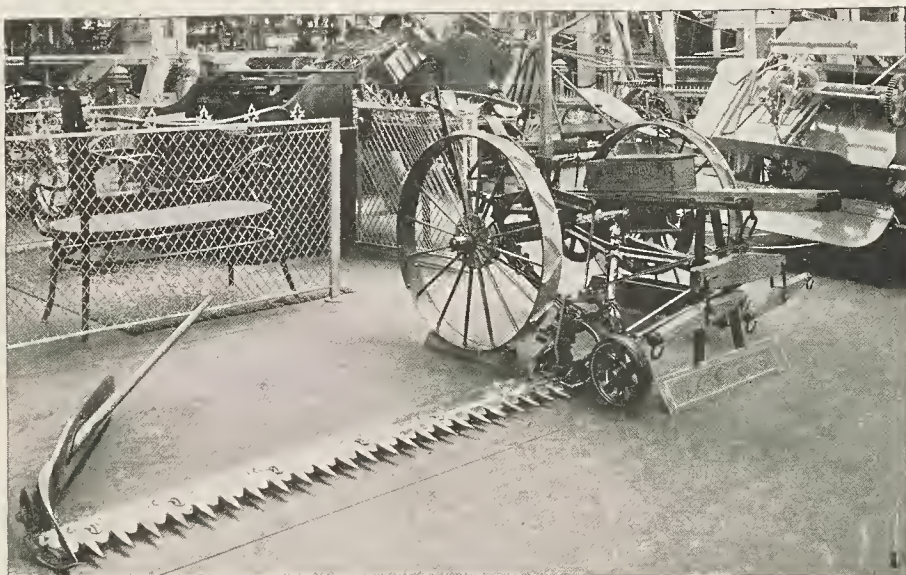
the soil simultaneously, and those which plough, hoe, cultivate, and rake at a single process. Other specialists are those which manufacture binder twine, an Auburn, New York, establishment constructing its entire pavilion of balls of this material. One of the most unique exhibits is that of the Eagle Cotton Gin company, of Bridgewater, Massachusetts, which has machinery in operation for illustrating the most improved system of freeing cotton from the seed, and preparing it for the

factory. In a model of an oil mill are displayed all the processes for extracting oil from this seed, formerly thrown away as worthless, and for grinding that which remains into fertilizing materials.

The second floor of the Agricultural building is divided transversely by two broad apertures, or light wells as they are often called, eight minor shafts running east and west between the several galleries. Collective American exhibits largely occupy this story, and first may be mentioned those of the brewers of the United States, installed in the broad aisle which skirts the western wall. There are about thirty participants, many of them with ornate and handsomely equipped pavilions, conspicuous among which are those of the Pabst Brewing company, of Milwaukee, and the Christian Moerlein brewery, of Cincinnati. The latter, neatly decorated in cream and gold, contains an array of richly costumed figures representing historic characters of many nations, with others symbolic of the four



WATER FILTER



MODERN MOWER

seasons, thus advertising the general consumption of Cincinnati beer. The Milwaukee establishment has a gilded model of its plant, on a scale of one inch to the foot, enclosed in a pavilion of terra cotta, crowned with a dome in mosaic work of stained glass. The headquarters of a Detroit company are fashioned entirely of bottles, and a Rochester brewer displays in motion a model of the machinery that makes his beer.

Occupying the entire southern gallery is the display of dairy implements and appliances, ranging from the common milk-jar and butter mould to machinery worked by steam, for the making of butter and cheese.



WINDMILL OF SALT

There are also many varieties of salt, the pavilion of a Genesee company showing in three large cases the grades best adapted to the manufacture of butter and cheese, with such as serve for table use. It is no secret that dairies use various preparations for hastening the curdling of cream, and giving color to cheese and butter. By a Copenhagen factory, with a branch at Little Falls, New York, are exhibited extracts and ferments for ripening cream, chemical coloring matters, and a collection of similar articles. In the centre of its pavilion is a large glass frame, containing the medals and prizes awarded at former expositions.

In the eastern gallery the state commissions and bee-keepers' associations have arranged an exhibit of honey and honey-comb in many forms, together with the most improved and recent apparatus used by apiarists. The exhibits of honey, whether in the comb or otherwise, are classified according to the food of the bees, including clover and basswood, white sage, buckwheat, and other varieties. Ten of the mid-continental and Pacific states, together with the province of Ontario, occupy sections in this group. New York has a collection of comb-honey weighing nearly 100 pounds, the product of a single colony at Attica. In the Nebraska case are specimens of finished workmanship in wax, in the form of cupids, angels, flowers, and fruits. Granulated honey and straw bee-hives are features in the Minnesota exhibit, and Illinois has a model of a house made entirely of wax.

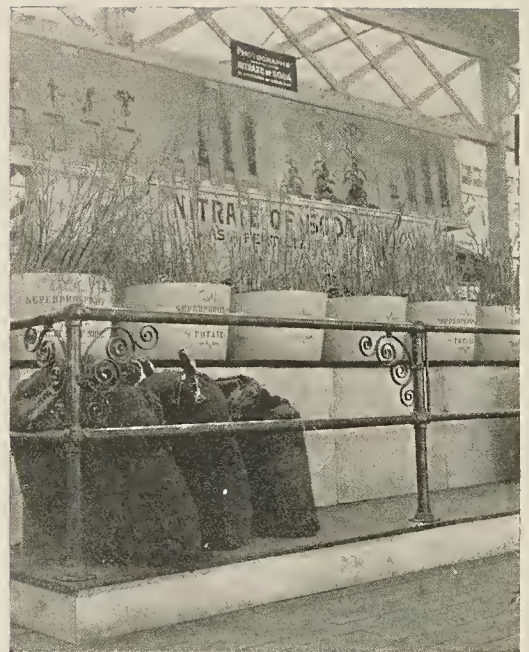
Adjacent to this section, enclosed by a bamboo railing, are several Javanese huts, on the walls of which, or forming a part of them, are native musical instruments, fashioned, as are the former, of bamboo. Rice and other grains, with coffee and tea, are here displayed, the last varying in color from light green to black. There are also Batavian hats of all grades, with swords and daggers, violins, and models of a native bullock cart and of one of the suspension bridges, in the building of which across deep chasms the Javanese show remarkable ingenuity. At the back of the booth hangs a large painting representing a village such as is reproduced on the Plaisance, and with extensive rice fields stretching far away toward the horizon. It is a cheerful, sunny scene, painted by a Javanese chief, who, though he never received instruction in art, was rewarded with a place of honor in this locality.

In the north gallery, west of the dome, are cases filled with domestic wools from nearly a score of states. Ohio and Wisconsin occupy entire sections with their numerous grades, fine and coarse, long and short, combing and pulled, washed, scoured, and unwashed. A Philadelphia house has an extensive display of foreign varieties, and near by New Zealand exhibits her wealth of animal fibre.



CANE SUGAR IN GLASSES

Between the east gallery and the central court, are exhibits of flour, and such food products as canned vegetables and meats, coffee, olives, apple butter, plum puddings, soups, starch, baking powder, yeast cakes, and oats, corn-meal, and buckwheat, in the form of food preparations, together with soaps and fertilizers whose bases are potash and soda. The most extensive display in the line of cereals is by a New York factory, in whose pavilion comely damsels in Quaker costume serve cakes made of the company's preparations from Quaker oats. Another manufacturer advertises his business in the form of a rustic hut, constructed of gilded cocoa-nuts, while a soap maker erects a pyramid of his special products on a thirteen sided base, representing the original



FERTILIZERS



EXHIBIT OF SOAP



CASTLE MADE OF TOBACCO

states, and above it a statue in soap of the woman who, as is said, was the first to fashion the stars and stripes in the form of the national emblem. Beyond is a section containing a series of photographs representing growing plants, with a row of vases containing vegetable life itself in all stages of growth, a case of crude nitrate of soda from Chile, and various fertilizers whose base consists of that compound.

In the southeastern gallery is an exhibit of the milling industries of the west, a Minneapolis company showing models of its mills, and a Duluth firm housing its miniature machinery, illustrative of the modern roller process, in a tiny mill with an old creaking wooden water wheel, the latter an exact reproduction of a factory built near Reading, Pennsylvania, a century and a half ago, and still operated by a descendant of the original owners.

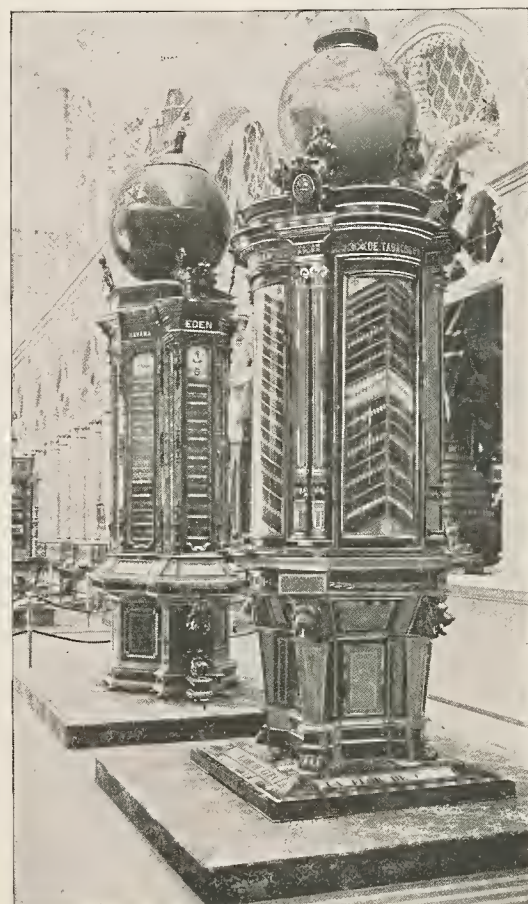
The western division of the gallery is largely occupied with preparations of food and drink, comprising such articles as condensed milk, evaporated cream, chocolate, cocoa, syrups, confections, macaroni, vermicelli, starch, mineral waters, cider, rum, brandy, liqueurs, and bitters, together with crackers and biscuits, cigars, leaf tobacco, and spices. Of the exhibits of condensed milk the most prominent is that of the New York Condensed Milk company, whose first works were established at Wolcottville, Connecticut, in 1856, by Gail Borden, president of the company until his death in 1874. For the products of this company, of which H. Lee Borden, the son of its founder, is now the president, it is claimed that they stand the test of all climates, and have been used in many lands for hundreds of thousands of children. The total quantity of milk thus treated in 1892 by various establishments in the United States exceeded 400,000,000, and by far the largest among them is the one referred to. The preserved milk, also prepared by this company, and largely supplied to the army during the civil war,



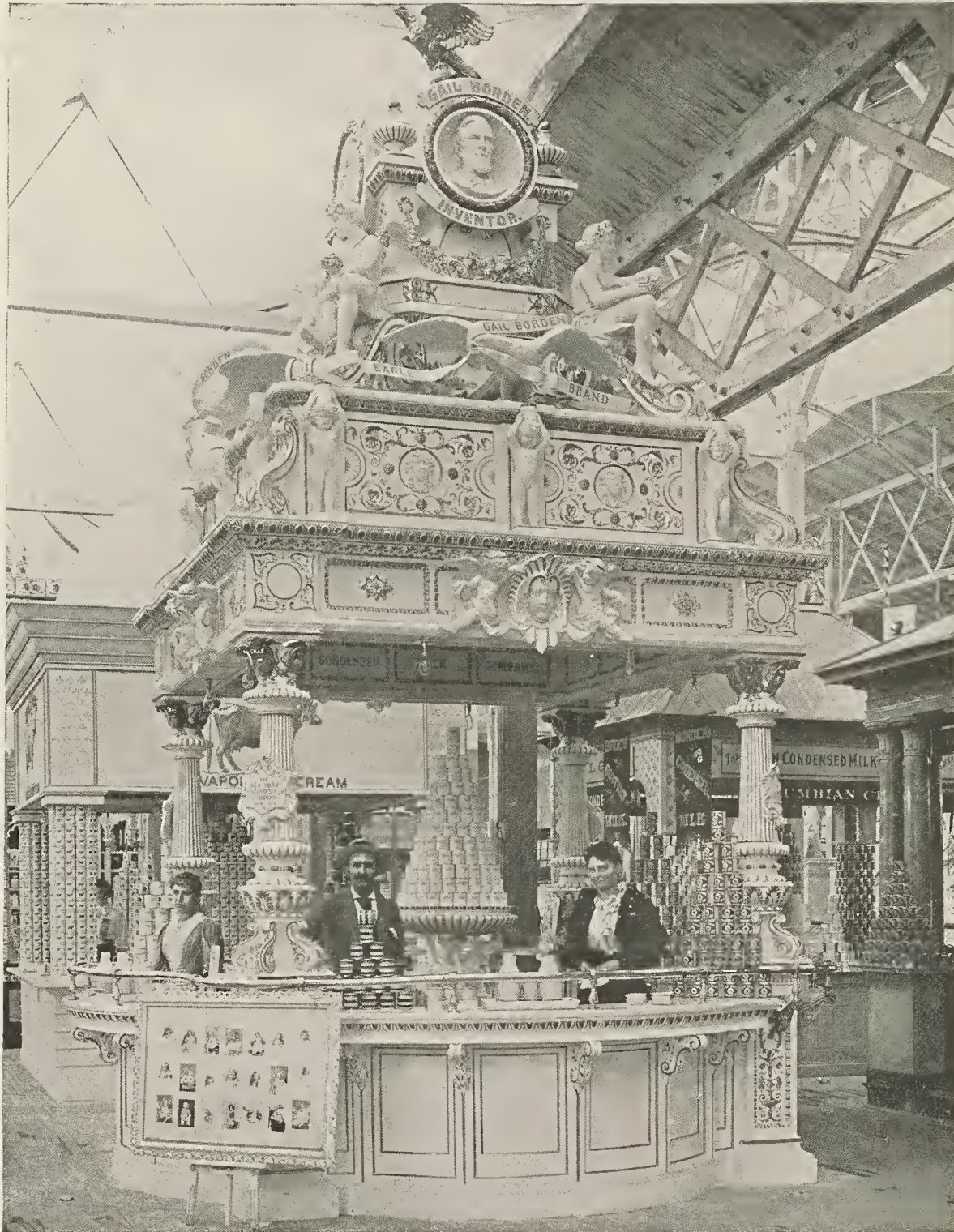
EGYPTIAN TOBACCO EXHIBIT



HEINZ PAVILION



CUBAN CIGARS



CONDENSED MILK

is condensed by a similar method, preserved with sugar, and hermetically sealed in cans.

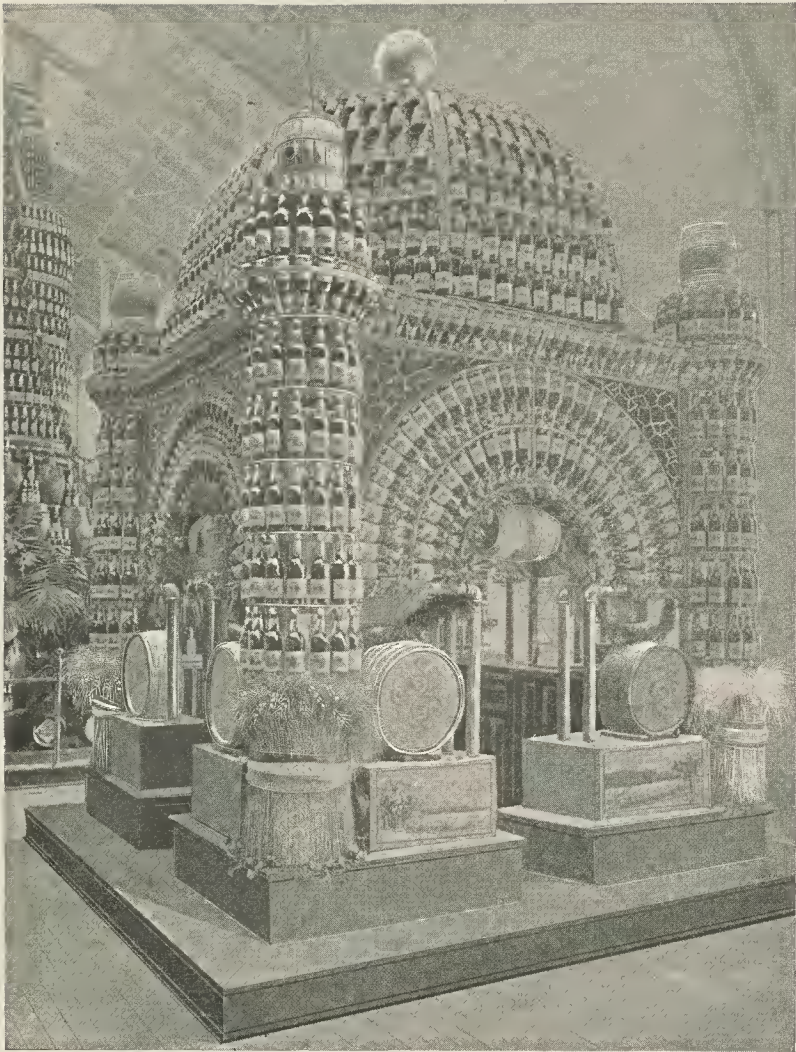
In the collection of mineral waters nearly all the states are represented, showing how generally such beverages are coming into use. In a large and handsome booth a New York confectioner, whose specialty is the manufacture of chocolate bon-bons, has modelled from that material heroic statues of Columbus, Venus de Milo, and Minerva. A starch company of Oswego, New York, reproduces a Grecian temple in cream, gold, and light green, whose pillars and cornices are elaborately carved by hand from solid blocks of wood. Several eastern manufacturers of crackers and biscuit have neat and tasteful pavilions, while many of the cigars and tobacco booths are of unique design, an Egyptian exhibitor advertising his wares in a temple covered with hieroglyphics, and containing miniature monoliths, pyramids, and other familiar forms of ancient architecture. There is also a pavilion built in the Corinthian style, its pillars composed of glass panels, through which may be seen varieties of smoking tobacco, while elsewhere is a case of

mahogany and rosewood, filled with cigars, and surmounted by a globe, above which is the historic *Pinta*.

A New Jersey firm, which manufactures the Tiger brand of tobacco, has in the centre of its exhibit a fine mounted specimen of the man-eating species, bearing in his mouth a pail of the prepared weed. Wisconsin, Connecticut, and Massachusetts have collective specimens of leaf tobacco, Connecticut's display being confined to the variety produced from Havana seed. Adjoining the group of the New England Tobacco Growers' association is a small booth in which Honduras illustrates the variety and quality of her tobaccos, both in leaf, and in the form of cigars. Among the exhibits of spices may be mentioned that of a Chicago firm, whose dealings are largely with Penang, representing in gaudy colors an ancient Malayan temple, with sections of the allspice tree, twigs of cinnamon, and other crude forms of the products in which it deals, the raw material being scattered among a varied display of manufactured articles. Finally there is a collection of syrups, suggestive of the maple groves of Vermont and Ohio.



COCOA BOOTH



STROH'S BREWING EXHIBIT

From agriculture in its proper sense let us turn to dairy-farming, a prominent industry in nearly all sections of the United States, where are more than 16,000,000 cows, or one to every four of her inhabitants, a larger number than is contained in Great Britain, France, and Germany combined.

In 1892 the dairy products of the republic included some 35,000,000 pounds of butter, worth nearly \$5,000,000, with more than 100,000,000 pounds of cheese, valued at \$9,000,000, this apart from what is consumed by farmers, and their families and employes, which probably represents almost an equal amount.

In the Dairy building we have one of the smallest, and yet one of the most interesting departments of the Exposition, for here is contained not only a choice and complete display of dairy products, but what has

been called a dairy school, where at intervals during the term of the Fair is held a series of tests for comparing the relative merits of various breeds of cattle. Here also are displayed in actual operation the best methods of handling milk and cream, and converting them into butter and cheese.

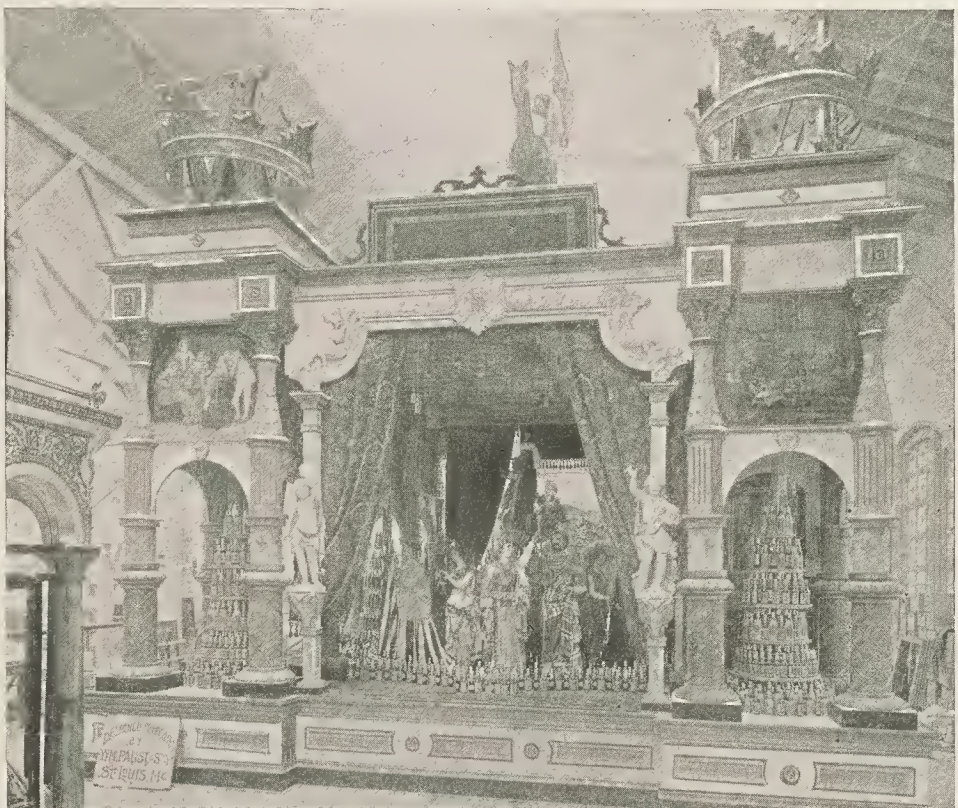
The structure is of simple design and neat exterior, covering somewhat less than half an acre in the southeastern portion of the grounds, near the Forestry building. Besides the offices of the department, the first floor contains the sections in which many of the states show their samples of butter and cheese, the latter also abundantly displayed in the galleries. The glass cases provided for the purpose are supplied with refrigerating apparatus, the cold air pipes banked under the floors, and against the walls. These sections occupy three sides of the hall in which machinery



CUSHING PROCESS OF DISTILLING WHISKEY, NEW YORK



LARGE BARREL MADE OF 10,500 SMALL ONES

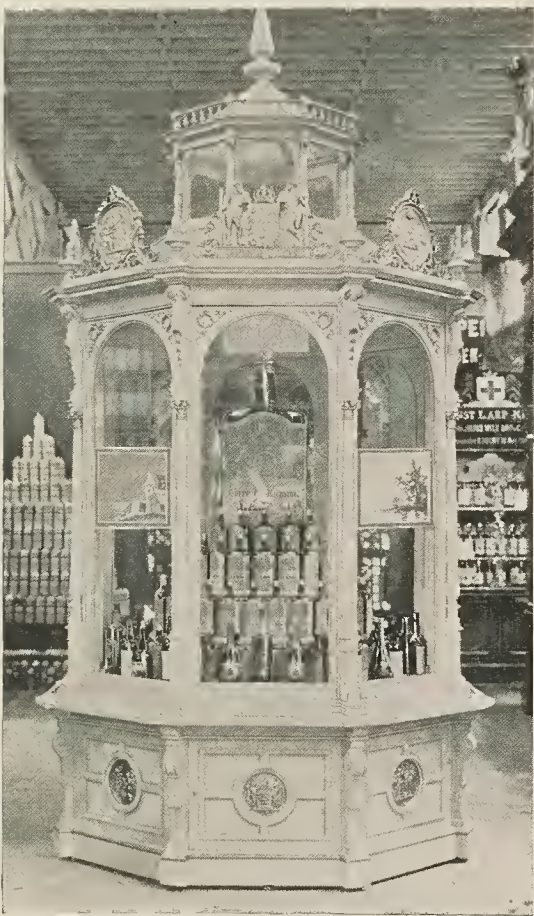


MOERLEIN'S EXHIBIT



LOOKING UP THE EAST LAGOON

is in operation for the testing of milk and cream, and their manufacture into butter and cheese. This is known as the model dairy, and is well supplied with seats for the accommodation of spectators. Beneath are refrigerators and cold storage rooms for the preservation of dairy products. On the second floor is a café, which overlooks the



A GALLERY EXHIBIT

Minnesota, and Nebraska ranged along the walls as specimens of yellow butter in plain and fancy shapes. The North Star state especially has an artistic display deftly molded in the form of flowers and fruits. Nebraska, one of the most prominent dairy states of the west, has an extensive assortment, an attractive feature being the heaps of butter globules, not yet fashioned, as elsewhere, into solid, grained masses.

New York, Iowa, Illinois, Ohio, Wisconsin, and Pennsylvania are also prominent in the Dairy building, though the exhibits of some of these states, with others of lesser note, were somewhat impaired by the partial failure of the refrigerating apparatus during the earlier days of the Exposition season. Moreover, on account of the contracted space available for the display of these products, the great dairy states were compelled to distribute their collections over the entire term of the Fair. Thus, as in the Livestock and Horticultural departments, no description written in the present tense would properly represent the case. Iowa, for instance, which ranks next to New York in this industry, had little to show in the month of August, while in June, September, and October scores of her creameries sent the most



SPECIMEN EXHIBIT



KINGSFORD'S OSWEGO STARCH EXHIBIT

lake, one of those secluded spots where the pilgrims of the Fair love to rest from their toil.

At a suitable distance south of the Dairy building are sheds containing 200 cows, all of which are contesting for the honors of the dairy, together with a collection of blooded calves that form an amusing exhibit. Jerseys, Guernseys, and short-horns are the chief of the rival breeds. From the time the milk is drawn from the cow until it arrives at the model dairy it is under the watchful care of scientists connected with the test committee, and representing various agricultural colleges and experiment stations, the different herds being in charge of the breeding associations, by which they have been collected from all sections of the country.

Entering the building from the east, we find the collections of Indiana, Minnesota, and Nebraska ranged along the walls as specimens of yellow butter in plain and fancy shapes. The North Star state especially has an artistic display deftly molded in the form of flowers and fruits. Nebraska, one of the most prominent dairy states of the west, has an extensive assortment, an attractive feature being the heaps of butter globules, not yet fashioned, as elsewhere, into solid, grained masses.



DISTILLED SPIRITS

fragrant of their products, filling several large sections. On the other hand,



OLD COCOA MILL

bottles and in concentrated form, with the apparatus by which they exclude the air and expel gases, thus effectually destroying the germs of disease. Here for the first time this invention has been publicly exhibited in the United States, where, as is asserted, it would largely aid in the development of dairy industries, since by its use milk can be kept in good condition and in unlimited quantity, ready to be forwarded from remote regions to the great centres of consumption. Iowa, Michigan, New York, and Wisconsin have all a considerable

August showed New York and Illinois to excellent advantage, with rich saffron-yellow butter from the empire state, and cheddar and other choice brands of cheese. The Illinois exhibit was at once artistic, massive, and historic, for here were not only tubs and mounds of butter, and cheeses of generous proportions, but from Minneapolis came flowers, log huts, and mottoes of welcome, fashioned of the more plastic material, while an Elgin farmer sent the can used for the first shipment of milk to Chicago by rail in 1852. In August a strong feature of the exhibit was a select lot of Dutch cheeses from Rotterdam, and at that time Missouri and New Hampshire were well represented both in butter and cheese.

In opposite galleries of the Dairy building are small French and German exhibits, the former consisting mainly of a few cheeses, labelled genuine Roquefort, and samples of prepared milk for infants, almost identical, as is claimed, with that which nature produces, the preparation being contributed by a society which supplies the hospitals of Paris. A similar exhibit was made in the German section by a Mecklenburg company, where also Berlin inventors show milk in



MENIER'S CHOCOLATE PAVILION



A MOONSHINER'S CABIN

space in the galleries, stocked with cheeses.

The series of experiments and tests conducted during the term of the Exposition were watched by dairymen from every part of the world. In the first ten days of May were illustrated the best methods of handling milk and cream, followed by tests of Jerseys, Guernseys, and short-horns as to the comparative value of breeds for the production of cheese, which is manufactured by machinery in the model dairy. In the closing days of May the apparatus for cheese making was replaced by such as is used for

butter, with additional illustrations of modern processes for handling milk and cream. From the last of May to the close of August were compared the relative values of dairy breeds as producers of butter, with the nutritive qualities of skim milk and buttermilk, and the increase or decrease of live weight. In the following month the contest was as to butter alone, and in October there were still further illustrations of the various methods of



THE BREWERS' PAVILIONS

treating milk and cream, and of butter making, with examples of what could be done with young herds in this connection. In these experiments were represented several cattle clubs and associations which concern themselves mainly with blooded grades of stock, the Exposition management furnishing quarters and feed, and retaining the produce of the model dairy.

For the cheese test between Jerseys, Guernseys, and short-horns, twenty-five cows were selected to represent each of these breeds, the American Jersey cattle club of New York gathering its choicest specimens from no less than



THE SCHLITZ PAVILION

culture, mention will be made elsewhere in this work, in connection with the Horticultural display.

WORLD'S FAIR MISCELLANY.—Exposition wits tell many amusing stories of the crowds which surge toward the galleries of Agricultural hall as the lunch hour approaches, as it is generally known that a number of exhibitors distribute their specialties in food and drink for advertising purposes. A cereal company, for instance, serves out biscuits; another, cakes; a third draws root beer for the thirsty; a fourth dispenses beef extract; a fifth, a dish of gelatine, thus permitting the needy to enjoy a gratuitous bill of fare. Among the jokes that passed current as to distinguished visitors was one concerning Edison, the great electrician, who, it is said, being lost for hours to his friends during a visit to the Fair, was finally discovered in one of these galleries eagerly devouring a large pancake spread with jelly.

In the Pennsylvania section, opposite the old-fashioned fireplace mentioned in the text, is an arm-chair with heavy wooden frame covered with corn-stalk, of which, it is said, 3,000 pieces were used, the stalks being cut in thin, narrow strips, and with ornamental designs. In the chimney corners are sprays of evergreens, with birds perched among the branches. What is the exact meaning of this fireside group of feathered songsters is not explained; but, as in love and war, everything is permissible at the World's Fair.

During the term of the Fair, vegetables in season and other perishable articles would be admitted, and, when necessary, might be replaced with fresh specimens under permit from the chief of the department, who reserved the right to remove such exhibits as were not properly cared for. In September there would be a special

display of potatoes and other tuberous food-plants, and in October one of sugar-beets. With exhibits of farm products must be forwarded, among other items, information as to the character of soil, the date of planting and harvesting, the mode of cultivation, the yield per acre, the price at the nearest home market, and the average temperature and rainfall

twenty states, and 30,000 thoroughbred animals. Among the exhibitors of Jerseys were Theodore A. Havemeyer, of New Jersey, and John Boyd, of Illinois, while Levi P. Morton sent some of his Guernseys, and in all the three breeds were many former prize winners. For several weeks before the cheese test in May animals of each class were placed in the sheds south of the Dairy building, and from their milking records the contestants were selected. Thus it was that the Jersey milch cow, Signal's Lily Flag, valued at \$15,000, and considered the queen of her race, was not permitted to enter the lists, for though with a record of more than 1,000 pounds of butter a year, at her preliminary trial she failed to meet the expectations of her admirers. Nevertheless the result was a decided victory for the Jerseys, the herd producing during the fortnight of the test more than 13,290 pounds of milk and 1,450 of cheese, against 10,900 and 1,130 pounds respectively for the Guernseys, and 12,180 and 1,070, for the short-horns. The highest award for cheese-making was for a Jersey cow named Ida's Marigold, the property of a Buffalo bank president. As an outcome of the test, it was found that Guernseys produced cheese at smaller cost than the others.

Of the exhibits contained in the Forestry building, though officially classed with the department of Agriculture, mention will be made elsewhere in this work, in connection with the Horticultural display.



between the time of planting and gathering the crop. For other branches of this department similar regulations were framed.

Dairy products would be received only between the 1st and 10th of June, July, October, and November. In making awards prominence would be given to the flavor of butter, for which would be accredited a maximum of 45 per cent, with 25 per cent for texture, 15 for color, 10 for packing. So with exhibits of cheese, except for slight variations. The display of butter includes



STATUARY ON AGRICULTURE BUILDING

ordinary and fancy brands, with creamery descriptions, one package only to each exhibit, and of specified weight. Exhibitors of cheese were restricted to a single specimen, limited as to weight and size. American and Canadian articles must be made of full new milk, and were generally classed as cheddars, flats, young Americas, domestic Swiss, brick, and dairy, others being subject to special regulations at the discretion of the chief of department.

To provide for a uniform and slightly display of honey and beeswax were provided the glass cases mentioned in the text at the joint expense of state commissions, bee-keepers' associations, and individuals, in proportion to the space occupied by each. Specimens of comb honey must not exceed 100 pounds, and of extracted honey and beeswax each 50 pounds. Exhibits were also invited of domestic and foreign bee culture, whether by ancient or modern appliances.

Exhibits of wool were classified as pure-bred fine, pure-bred middle, pure-bred long, and cross-bred descriptions. Entries must consist of a single fleece as taken from the sheep in its natural condition, displays of Cashmere, Angora, Alpaca and Vicuna wools being subject to the same regulations as the rest.

Among the artistic phases of the agricultural display mention should be made of the miniature models of domestic animals in one of the galleries, the originals of which were copies from life by Max Landsberg. Horses, donkeys, mules, cattle, sheep and swine, are all moulded and painted in natural colors, and with marvellous fidelity of delineation. The originals are the property of the Imperial Agricultural university of Berlin.

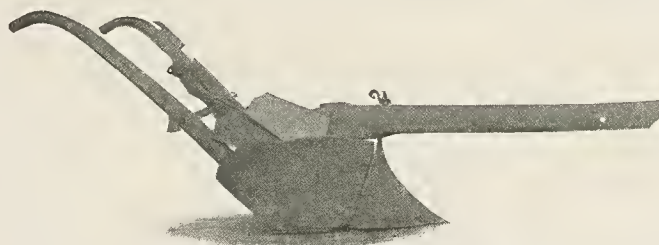
Not far from the shore of the south pond is a miniature house surrounded by a broad veranda, and near it a plat of ground has been laid out in sections showing strata of crushed stone, soil, macadam, and other substances, arranged in regular layers. This is the

exhibit of the National league of good roads, a young organization, but one in which substantial merchants, farmers, and others are largely interested, their efforts to secure better country roads meeting with favorable consideration from the United States department of agriculture. It was at first proposed to build a model road 1,000 feet in length, from the Forestry building to the Live-stock pavilion, but this project was abandoned in favor of the more condensed exhibit around the league's pavilion. Here sections of road are shown whose beds, varying in thickness, are constructed of macadam covered with fine stone and sand, and those whose principal material is stone. Highways are also arranged in forms best suited for wet and dry lands, for clayey or sandy soils.

By several firms to whom were granted concessions to sell confections and beverages upon the grounds, ornate pavilions were erected. Among the most elegant is that of the Lowney company, of Boston, manufacturers of chocolate bonbons, whose structure is near the Manufactures building, while the most unique is that of the Blooker cocoa company, a quaint reproduction of an ancient Amsterdam mill, located on the shore of the south pond. It was during the early portion of the present century that two brothers of the Blooker family established this business, the windmill now represented at the Fair then grinding the cocoa beans into the product which has since acquired an excellent reputation. Adjoining the mill, or rather forming a portion of it, is a Dutch house of the old style, built and furnished to illustrate the surroundings of a burgher of moderate means, and refined tastes. The furniture and pottery are essentially Dutch, and of superior quality, and there are girls who serve the cocoa dressed in the national costumes of the Netherlands as worn in early days. Very noticeable, also, among the chocolate booths is that of Menier, the French manufacturer, which, in its dress of white and gold, stands south of the entrance to the Mines and Mining building, and within the court of honor.

A picturesque display in connection with the Agricultural department is the collective exhibit of windmills, mainly by Illinois, Iowa, Ohio, Indiana, and Michigan factories, and grouped around the shores of the south pond, between the intramural road and the buildings of the French colonies.

Among the larger collections of mineral waters in the galleries of the main hall are those from Waukesha, Wisconsin, arranged in



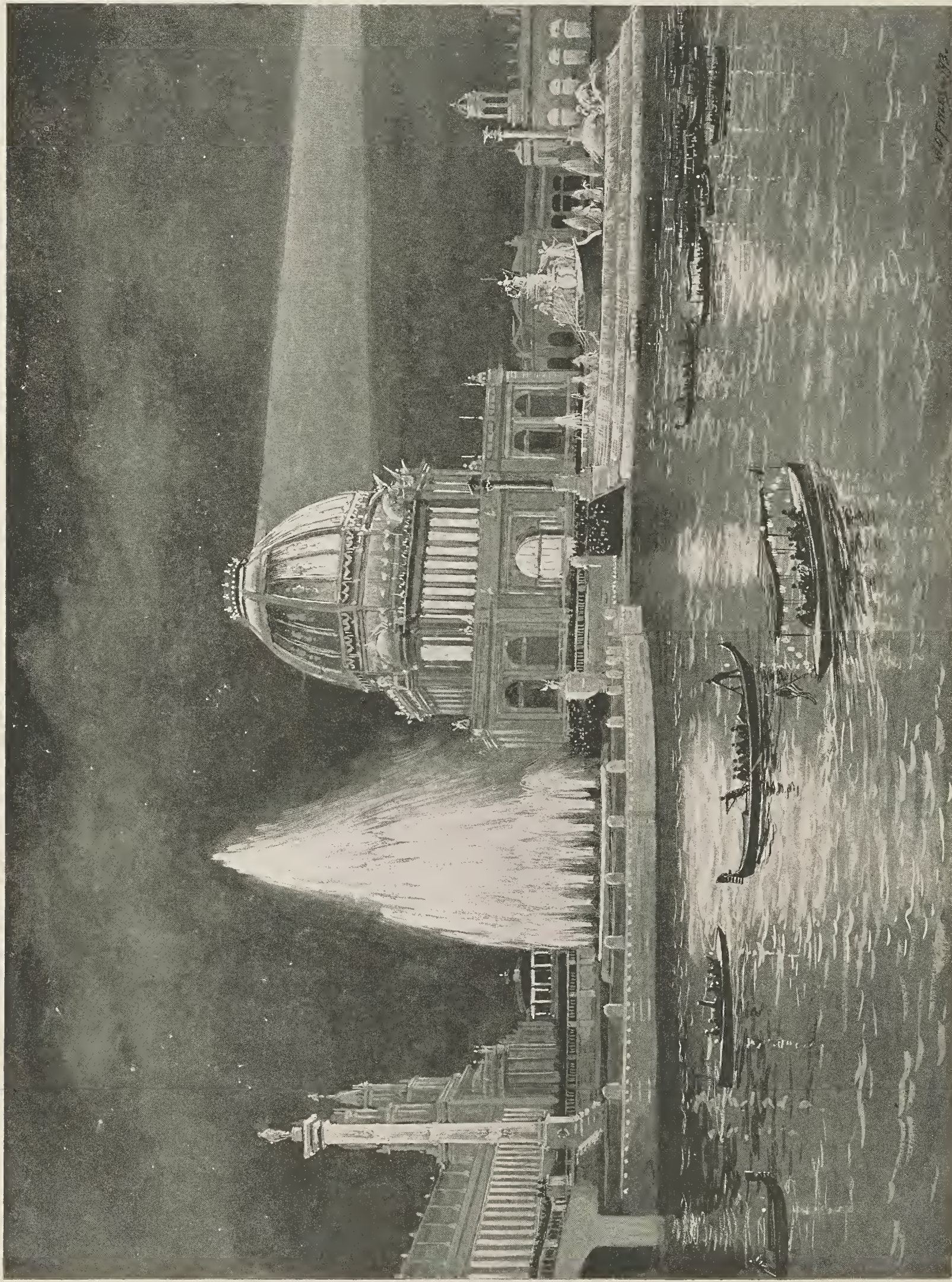
OLD-FASHIONED CANADIAN PLOUGH

the form of gigantic bottles; but the real exhibit is distributed over the entire grounds. To the Waukesha Hygeia company was awarded the concession for supplying visitors with mineral water, and for this purpose stands were erected both in grounds and buildings. The water was pumped from the source of supply in Wisconsin, and near the terminal railway station, the company erected a power house and a pavilion of unique design, its main entrance in the form of a court, containing an ornamental basin, into which the water is forced, still bubbling and sparkling. Thence it is conveyed in pipes to its many points of distribution, and sold at the rate of one cent a glass.

In the rear of the Anthropological building are two unique exhibits by Louisville manufacturers of whiskies, each of whom claims to produce the real old-fashioned article by modern methods. One of these firms has erected a log hut, or moonshiner's cabin, with imitation mud plaster between its timbers, and with pieces of glass or crockery inserted as ornamental features. Inside, however, the parallel is not faithfully developed. Floors and walls are of the finest wood, and sour mash and rye are displayed in most seductive forms. The so-called Old Times distillery company has a commodious two-story distillery in actual operation, with bonded warehouse, and a United States gauger's office within. Whiskies labelled Old Times, Kentucky Comfort, Gladstone, and others, are exhibited in the room containing the stills. On a placard prominently displayed the visitor is warned not to ask too many questions on pain of having some of them unanswered.

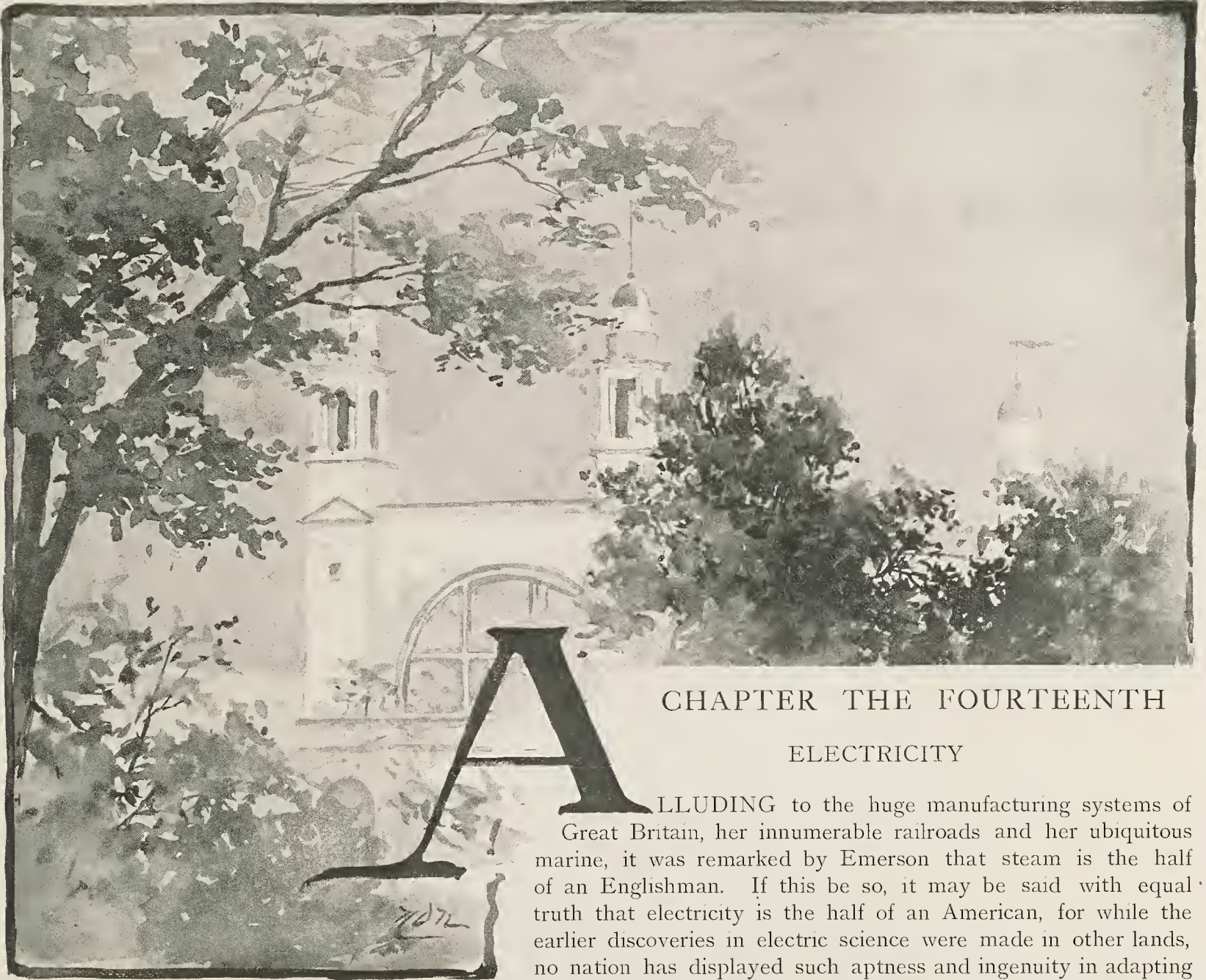


WINDMILLS SOUTH OF AGRICULTURE BUILDING



ILLUMINATION OF THE COURT OF HONOR

1875



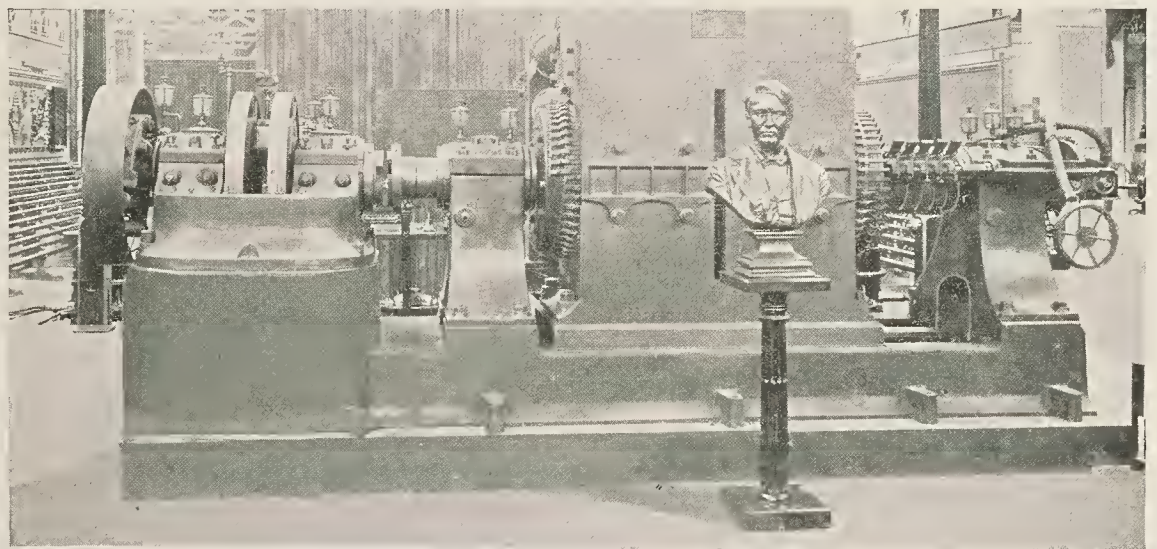
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ELECTRICITY

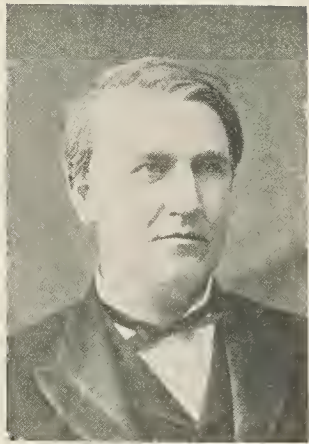
ALLUDING to the huge manufacturing systems of Great Britain, her innumerable railroads and her ubiquitous marine, it was remarked by Emerson that steam is the half of an Englishman. If this be so, it may be said with equal truth that electricity is the half of an American, for while the earlier discoveries in electric science were made in other lands, no nation has displayed such aptness and ingenuity in adapting them to practical use. Here the patient and ill requited toil

of Samuel Morse has fructified into a network of telegraph lines, which carry the tidings of the world with the swiftness of thought to every section of the republic; here was conceived the plan for the first of our submarine cables, and here was invented the telephone, by means of which many millions of spoken words are carried daily over the wires. And so with apparatus for lighting, motion, the transmission of power, and other purposes, our electric lamps and dynamos, our motors and cars being now exported to every quarter of the earth.

And yet to-day we know no more of what electricity is than did Theophrastus or the elder Pliny, both of whom speak of the property of amber for attracting such light substances as straws and leaves. We have learned that it is not a fluid, as was formerly supposed, that it is not matter, any more than are light and heat; but when we say that it is a force, or rather the cause of a force, we have said about all that has thus far been discovered as to this the most puissant of nature's potencies. It is not until recent years that electric power has been applied to practical purposes apart from the telegraph, or indeed was supposed to be capable of such application. In 1882, for instance, was opened the first central station for lighting streets and buildings; in 1893 there were nearly 1,300 stations with 2,500,000 lamps. In 1881 the first isolated plant was erected on the shore of Blue Mountain lake; in 1893 there were 3,500 isolated plants with 1,443,000 lights. In 1885 was built the first electric railway, with its mile or two of track;



EDISON'S APPARATUS



THOMAS A. EDISON

in 1893 there were 435 electric railways in operation, with 5,000 miles of track and 8,500 motor cars. In many steamship lines on ocean, lake, and river vessels are lighted by electricity, while in warfare, in mining, metallurgy, mechanics, and in the transmission of power for various purposes, it is rapidly coming into use. All this is fully illustrated at the Fair, where electricity is almost ubiquitous, for there is hardly a corner of the buildings or grounds where its agency is not manifest in one form or another.

To the majority of Exposition sight-seers the most attractive feature in connection with the department of Electricity is the illumination of grounds and buildings, of fountains and waterways, forming, with the play of search-lights, a more striking illustration of the wonders wrought by this science than any mere collection of machinery could possibly be. The decorative lighting of the grounds is concentrated chiefly on the main plaza, the shore line of the central basin, its border of flower beds, and the cornice lines of the buildings rising to a uniform height above the court. The outer surface of the Administration building, with its dome and corona, are also traced in lines of light. Elsewhere exterior illumination is restricted to the Wooded island, to loggias and colonnades, to Festival hall and the terminal railway station.


As to interior illumination, the following description by the chief of the department may be of interest:



LOOKING SOUTH FROM CENTRE OF HALL

‘The two problems of lighting, by far the most difficult presented, have been the lighting of the Art galleries, with their two miles of reflecting screens, and the lighting of the dome of the Administration building, which is larger by far than the dome of the capitol at Washington. On the floor of this dome, which is octagonal, there are in the eight angles as many great spreading candelabra of special and beautiful design, each bearing 50 lamps. High up, at the spring of the interior dome, is a gallery running clear around it. The gallery has a metal railing, and upon this railing are 56 seven-light standards, forming a great corona of light 120 feet in diameter. Far up above, and through the opening in the top of the false dome, is seen the beautiful painting upon the ceiling of the outer dome, as illuminated by a circle of arc lights which are themselves hidden from view between the two domes.’

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